12/96 FORM 1

1-31-00

Sheet 1 of 4

A

TRANSMITTAL FORM FOR FILING PATENT APPLICATION

Attorney
Docket No.: KT-001AX

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Express Mail No: EL418425196US

BOX PATENT APPLICATION
Assistant Commissioner for Patents
Washington, D.C. 20231

Date: January 28, 2000
First Named Inventor or
Application Identifier: James D. Schlick

Sir:

Transmitted herewith under 37 CFR § 1.53 for filing is the patent application of:

Inventors:	James D. Schlick	Rich Berner	Joel Schwarzbart
	Andrew D. Longman	Gloria Gery	Peter DePaula
	Betsy L. Alvarez	Robert Yardumian	Barbara Stoeber
	Matt Hummel	Katherine Nicole Bussard	Michael Smith
	Sandra Lee	Sean Connelly	Christabel Nazareth
	Jad Santos	Justin Wilmsmeyer	James Mullins
	Phong Dinh	Martin Vernon	Thomas H. Irwin
	Rachel Cline	Karl Hogquist	

Entitled: METHOD AND APPARATUS FOR PROBLEM SOLVING, DECISION MAKING AND STORING, ANALYZING, AND RETRIEVING ENTERPRISEWIDE KNOWLEDGE AND CONCLUSIVE DATA

[X] This is a request for filing a [X] **continuation** [ ] **divisional** [ ] **continuation in-part** application under §1.53(b) of prior Application No. 09/347,238 , filed July 2, 1999 entitled: METHOD AND APPARATUS FOR PROBLEM SOLVING, DECISION MAKING AND STORING, ANALYZING, AND RETRIEVING ENTERPRISEWIDE KNOWLEDGE AND CONCLUSIVE DATA

Enclosed are:

[X] 43 pages of written description, claims and Abstract, inclusive

[X] 127 sheets of [X] informal [ ] formal drawings of Figs. 1-137 (one set)

[X] Oath or Declaration
- [ ] Newly executed (original or copy)
- [ ] Copy from prior application (37 CFR 1.63(d)) (for continuation/divisional). The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
- [X] To be filed later

[ ] Cover sheet and Assignment of the invention to:

[ ] Certified copy of a _____ application (if foreign priority is claimed) with letter claiming priority under Rule 55.

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TRANSMITTAL FORM FOR FILING PATENT APPLICATION (CONTINUED)

Attorney Docket No.: KT-001AX

[X] Information Disclosure Statement with 14 citations

[X] Preliminary amendment is enclosed.

[X] Return receipt postcard

[X] Other: *Petition for Extension of Time Under Section 1.136 for parent case Serial No. 09/347,238 (COPY)*
Request for Deletion of Inventor Under MPEP § 201.03

[X] Verified statement of Small Entity was filed in prior application. Status still proper and desired

[X] Priority is claimed under 35 USC § 120 as indicated on the attached sheet 4.

[ ] Priority is claimed under 35 USC §119(a)-(d) as indicated on the attached sheet 4.

[X] Priority is claimed under 35 USC §119 (e) as indicated on the attached sheet 4.

[X] Christopher J. Lutz is hereby appointed Associate Attorney by:
Registration No.: 44,883

Attorney of Record: Gordon R. Moriarty
Registration No.: 38,973

[ ] **Power of Attorney** in the originally-filed application has been granted to one or more of the registered attorneys listed below. The attorneys listed below not previously granted power in the originally-filed application, as well as _____, are hereby given associate power:
Registration No.:

Stanley M. Schurgin, Reg. No. 20,979
Charles L. Gagnebin III, Reg. No. 25,467
Paul J. Hayes, Reg. No. 28,307
Victor B. Lebovici, Reg. No. 30,864
Eugene A. Feher, Reg. No. 33,171
Beverly E. Hjorth, Reg. No. 32,033
Holliday C. Heine, Reg. No. 34,346
Gordon R. Moriarty, Reg. No. 38,973

[ ] Cancel in this application original claims _____ of the prior application before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)

[ ] Add in this application claims _____ per amendment before calculating fee.

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Attorney Docket No.: KT-001AX

TRANSMITTAL FOR FILING PATENT APPLICATION (CONTINUED)

CLAIMS FILED:	MINUS BASE:	EXTRA CLAIMS:	RATE:	BASIC FEE:
				$690.00
Independent	3 - 3	= 0	x $78.00 =	0.00
Total	3 - 20	= 0	x $18.00 =	0.00
[ ] Multiple Dependent Claims (1st presentation)			+ $260.00 =	0.00
			SUBTOTAL FILING FEE	$690.00
Small Entity filing, divide by 2. (Note: verified statement must be attached per §1.9, §1.27, §1.28.)				$345.00
			TOTAL Filing Fee	$345.00

[ ] The filing fee has been calculated above; a check in the amount of _____ is enclosed.

[X] The filing fee will be submitted at a later date.

[X] In the event a Petition for Extension of Time under 37 CFR §1.17 is required by this paper and not otherwise provided, such Petition is hereby made and authorization is provided herewith to charge Deposit Account No. 23-0804 for the cost of such extension.

[ ] The Commissioner is hereby authorized to charge payment of any additional filing fees under 37 CFR §1.16 associated with this communication or credit any overpayment to Deposit Account No. 23-0804.

Address all future communications to:

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Attorney of Record: Christopher J. Lutz
Registration No. 44,883

TRANSMITTAL FOR FILING PATENT APPLICATION (CONTINUED)

[X] Priority is claimed under 35 USC § 120 of prior Application(s) No. 09/347,238, filed July 2, 1999, entitled: METHOD AND APPARATUS FOR PROBLEM SOLVING, DECISION MAKING AND STORING, ANALYZING, AND RETRIEVING ENTERPRISEWIDE KNOWLEDGE AND CONCLUSIVE DATA

[ ] The above-identified application(s) is/are assigned of record to:

[ ] Priority is claimed under 35 USC § 119 (a)-(d) of the following application(s).

(Application Number)	(Country)	(Filing Date)

[ ] The above-identified application(s) is/are assigned of record to:

[X] Priority is claimed under 35 USC § 119 (e) of the following provisional application(s).

(Application Number)	(Filing Date)
60/091,476	July 2, 1998
60/133,746	May 12, 1999

[X] The above-identified provisional application no. 60/091,475 is assigned of record to: KEPNER-TREGOE, INC.

[X] The claim of small entity status in the above-identified provisional application(s) is made in this application and a copy of the small entity form(s) from the provisional application(s) is/are enclosed.

DGB/CJL/jds
SUBMIT IN TRIPLICATE
219144

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PPLICANT:	JAMES D. SCHLICK ET AL.	ATTORNEY DOCKET NO.:	KT-001Xq800
PPLICATION NO.:		EXAMINER:	
ILED:	JULY 2, 1998	GROUP NO.:	
ATENT NO.:		ISSUED:	
NTITLED:	ELECTRONIC TOOL		

VERIFIED STATEMENT AS SMALL ENTITY

ssistant Commissioner for Patents
ashington, D.C. 20231

ir:

THE UNDERSIGNED DECLARE(S):

xclusive rights in the above-identified invention reside in the "small entity(ies)" defined and amed below, and "small entity" fees are appropriate. Qualification as a small entity is based pon the appropriately checked statements below:

] INDEPENDENT INVENTOR(S)

he below-signing independent inventor(s) has (have) not assigned, granted, conveyed or licensed, nd is (are) under no obligation under contract or law to assign, grant, convey or license any ights in the invention to any person who could not likewise be classified as an independent nventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would ot qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 7 CFR 1.9(e).

X] SMALL BUSINESS CONCERN

he below-identified small business concern qualifies as a small business as defined in 3 CFR 121.1301 through 121.1305, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced ees under Section 41(a) and (b) of Title 35, in that the number of employees, including those f its affiliates, which does not exceed 500 persons, and it has not assigned, granted, conveyed r licensed, and is under no obligation under contract or law to assign, grant, convey or icense, any rights in the invention to any person who could not be classified as an independent nventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would ot qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 7 CFR 1.9(e).

oncerns are affiliates of each other when, either directly or indirectly, one concern controls r has the power to control the other, or a third party controls or has the power to control oth. The number of employees of the business concern is the average over the fiscal year of the ersons employed during each of the pay periods of the fiscal year. Employees are those persons mployed on a full-time, part-time or temporary basis during the previous fiscal year of the oncern.

Express Mail Number

EL418425196US

Attorney
Docket No.: KT-001Xq800

[ ] NONPROFIT ORGANIZATION (Check additional applicable box.)

The below-identified nonprofit organization qualifies as a small entity under 37 CFR 1.9(e) in that it constitutes:

1. [ ] a university or other institution of higher education located in any country; or

2. [ ] an organization of the type described in Section 501(c)(3) of the Internal Revenue Code of 1954 (26 USC 501(c)(3)) and exempt from taxation under Section 501(a) of the Internal Revenue Code (26 USC 501(a)); or

3. [ ] any nonprofit scientific or educational organization qualified under a nonprofit organization statute of a state of the United States (35 USC 201(i)); or

4. [ ] any nonprofit organization located in a foreign country which would qualify as a nonprofit organization under paragraphs (e)(2) or (3) of Rule 1.9 if it were located in the United States.

The undersigned acknowledge(s) the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate (37 CFR 1.28(b)).

The below-signing individual(s) hereby declare(s) that (he, she, they) are authorized to execute this statement on behalf of the small entity.

Name of Small Entity: (Independent Inventor/Small Business/Nonprofit) Kepner-Tregoe, Inc.
Address of Small Entity: (Street, City, State or Country, Zip Code) 17 Research Road, Princeton, New Jersey 08558
Name of Person Signing: (Small Business/Nonprofit) Theodore F. Hiller, Jr., Esq.
Title of Person Signing: (Small Business/Nonprofit) Secretary and General Counsel

Signature: (Please sign and date in permanent ink.)	Date Signed:
X Theodore F. Hiller Jr.	X July 20, 1998

124263

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application	:	James D. Schlick, et al.
Filed	:	Herewith
For	:	METHOD AND APPARATUS FOR PROBLEM SOLVING, DECISION MAKING AND STORING, ANALYZING, AND RETRIEVING ENTERPRISEWIDE KNOWLEDGE AND CONCLUSIVE DATA
Attorney's Docket	:	KT-001AX

Group Art Unit:

* *

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Patent Application, Assistant Commissioner for Patents, Washington, D.C. 20231 on _____.

By _____
Christopher J. Lutz
Registration No. 44,883
Attorney for Applicants

* *

PRELIMINARY AMENDMENT

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Kindly enter the following Preliminary Amendment in the above-identified application, as follows.

In the Specification

Please amend the specification as follows.

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Express Mail Number
EL418425196US

At line 14, after "incorporated herein by reference.", please insert the following:

This application claims priority under 35 U.S.C. 120 to U.S. Application No. 09/347,238, filed July 2, 1999, entitled METHOD AND APPARATUS FOR PROBLEM SOLVING, DECISION MAKING AND STORING, ANALYZING, AND RETRIEVING ENTERPRISEWIDE KNOWLEDGE AND CONCLUSIVE DATA.

REMARKS

The Examiner is invited to telephone the undersigned attorney with any matters that may advance the prosecution of this application.

Respectfully submitted,

JAMES D. SCHLICK, ET AL.

By _____
Christopher J. Lutz
Registration No. 44,883
Attorney for Applicants

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Date: 1/28/00

GRM/jds
219202

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TITLE OF THE INVENTION

Method and Apparatus for Problem Solving, Decision Making and Storing, Analyzing, and Retrieving Enterprisewide Knowledge and Conclusive Data

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims priority under 35 U.S.C. §119(e) to U.S. Provisional Patent Application No. 60/091,476, filed July 2, 1998, entitled ELECTRONIC TOOL, and U.S. Provisional Patent Application No. 60/133,746, filed May 12, 1999, entitled ELECTRONIC TOOL, both incorporated herein by reference.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

NOTICE REGARDING COPYRIGHTED MATERIAL PURSUANT TO 37 CFR § 1.71

BACKGROUND OF THE INVENTION

Modern business enterprises must address issues surrounding the business in a systematic, often time-driven, manner. Such business enterprises typically have an organizational structure, often of a hierarchical or matrix form, to define the various groups of individuals responsible for a particular area of the business. Often a particular issue evokes different concerns from different groups, resulting in differing definitions of a problem to be addressed. Further, individuals within the groups may not have the knowledge, or expertise, to effectively

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address a particular problem or decision, due to factors such as inexperience or lack of longevity in a particular role.

Lines of communication can become blurred when individuals assume they share a common understanding of a problem. The notion of a problem surrounding a complex situation can have different meanings to different groups or individuals within the business enterprise. The term "problem" is often used indiscriminately to define factors such as a complex situation requiring action, a malfunction or error, the cause of a malfunction or error, a difficult choice, or future trouble. Each of these concerns requires different action, yet all elements may be common to a particular situation. Prior to implementing action, such a situation must be broken down into a manageable set of issues which require action, and which can be verified as the correct set of issues which will resolve the situation.

Effectively addressing the issues presented by such a complex situation, therefore, requires clarification of the exact issues to be acted upon. However, as indicated above, different groups and/or individuals have different needs, and each may have a different definition of the problem, depending on how the complex situation affects the responsibilities of that group and/or individual. Further, employment terminations, transfers, and organizational changes can result in a lack of individuals with expertise and experience concerning such a complex situation. Such factors can cause a business enterprise to implement ineffective actions, perform duplicative acts, or even to implement actions which exacerbate the situation.

It would be beneficial to provide a computer software program adapted to provide an interactive interface to receive information surrounding such a complex situation, display such information in a format which allows the user to refine issues in a stepwise manner, and store such information, including both the solution or resolution and

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the thought processes that created them, for subsequent query and retrieval by multiple users for addressing future such complex situations.

BRIEF SUMMARY OF THE INVENTION

A computer software application, graphical user interface (GUI), and method for entering information concerning a complex business situation, refining such information in a stepwise manner through such an interface, generating a list of effective actions for addressing such a business situation, and storing such information in a knowledge base adapted for future query and reporting use for such complex business situations, is provided. A set or sequence of process screen structures allows entry of specific aspects of such a situation to generate such an action list. Such process screen sequences provide a systematic method to gather and organize information effectively in order to resolve a complex situation, and to store such information in a knowledge base for later query and retrieval for the same or similar situations, thereby preserving enterprisewide knowledge and expertise. An action tracker interface is also provided which provides task management and monitoring of the various actions determined by the process screen sequences. The user has the ability to access the process screens in a non-linear mode and can toggle between interview and worksheet modes described further below.

A situation appraisal process screen sequence provides a starting point in assessing a complex or ill-defined business situation. An interface for entering concerns presented by such a situation is presented to a user, and allows prioritization and categorization of such concerns. In this manner a user determines which concerns should be addressed first, and whether these concerns present a problem to be resolved, a decision to be made, or a potential problem which could result from a present plan or

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decision. A list of actions to be undertaken by groups or individuals is defined through the action tracker interface to address the prioritized concerns, and includes an indication of which of the other process screen sequences should be undertaken: problem analysis, decision analysis, and/or potential problem/opportunity analysis.

A problem analysis process screen sequence provides an interface for entering information surrounding the problem in a selectively sequential, orderly manner, and for entering possible causes for the problem by drawing on the experience of the user and the knowledge base of past situations. Possible causes are then evaluated and eliminated in a prioritized manner to determine which possible cause explains the facts presented by the problem, and confirmed to be the true cause by verifying any questionable information pointing to the most probable cause. Actions and tasks needed to be undertaken to verify the most probable cause are assigned and monitored through the action tracker interface.

A decision analysis process screen sequence provides an interface to allow entry of a PURPOSE OF A DECISION based on specific lists of results sought, and entering alternatives which might satisfy each result. Alternatives are then considered with respect to each result. Various risks associated with each alternative are entered, and are ranked based on magnitude and probability. A decision choice is then determined by scrolling through and balancing the alternatives and risks. A decision analysis may be undertaken based on a situation appraisal, may be used to assess several possible causes resulting from a problem analysis, or may be undertaken independently. Actions needed to implement the decision are then entered and tracked using the action tracker interface.

A potential problem/opportunity analysis process screen sequence provides an interface to assess and determine actions to mitigate or eliminate future possible

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problems and capitalize on opportunities which may arise during implementation of decisions and plans. This process screen sequence may be undertaken as indicated by a situation appraisal, may be used to evaluate a decision indicated by a decision analysis, or may be undertaken independently. Possible future problems or opportunities are identified and entered, and likely causes of each future problem are identified. Preventative actions which serve to reduce the likelihood of occurrence of each of the future problems are developed by scrolling through the likely causes, and contingent actions which may mitigate the result should the future problem occur despite the preventative action are also entered. Tasks required to implement the preventative actions and contingent actions are then entered and tracked using the action tracker interface.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The invention as defined herein will be more fully understood by reference to the following drawings and detailed description of the drawings, of which:

Fig. 1 shows a top level functional block diagram;

Fig. 2 shows a system architecture block diagram;

Fig. 3 shows a flowchart of the situation appraisal process screen sequence;

Fig. 4 shows a flowchart of the problem analysis process screen sequence;

Fig. 5 shows a flowchart of the decision analysis process screen sequence;

Fig. 6 shows a flowchart of the potential problem analysis process screen sequence;

Fig. 7 shows the LIST THREATS AND OPPORTUNITIES screen of the Situation Appraisal screen sequence;

Fig. 8 shows the SEPARATE AND CLARIFY CONCERNS screen of the Situation Appraisal screen sequence;

Fig. 9 shows the CONSIDER SERIOUSNESS, URGENCY AND GROWTH screen of the Situation Appraisal screen sequence;

Fig. 10 shows the DETERMINE ANALYSIS NEEDED screen of the Situation Appraisal screen sequence;

Fig. 11 shows the DETERMINE HELP NEEDED screen of the Situation Appraisal screen sequence;

Fig. 12 shows the STATE THE PROBLEM screen of the Problem Analysis screen sequence;

Fig. 13 shows the SPECIFY THE PROBLEM screen of the Problem Analysis screen sequence;

Fig. 14 shows the USE DISTINCTIONS AND CHANGES screen of the Problem Analysis screen sequence;

Fig. 15 shows the STATE POSSIBLE CAUSES screen of the Problem Analysis screen sequence;

Fig. 16 shows the TEST POSSIBLE CAUSES AGAINST SPECIFICATION screen of the Problem Analysis screen sequence;

Fig. 17 shows the DETERMINE THE MOST PROBABLE CAUSE screen of the Problem Analysis screen sequence;

Fig. 18 shows the GATHER FACTS TO VERIFY THE TRUE CAUSE screen of the Problem Analysis screen sequence;

Fig. 19 shows the THINK BEYOND THE FIX screen of the Problem Analysis screen sequence;

Fig. 20 shows the STATE THE DECISION screen of the Decision Analysis screen sequence;

Fig. 21 shows the DEVELOP OBJECTIVES screen of the Decision Analysis screen sequence;

Fig. 22 shows the CLASSIFY OBJECTIVES INTO MUSTS AND WANTS screen of the Decision Analysis screen sequence;

Fig. 23 shows the WEIGHT THE WANTS screen of the Decision Analysis screen sequence;

Fig. 24 shows the GERNERATE ALTNERATIVES screen of the Decision Analysis screen sequence;

Fig. 25 shows the SCREEN ALTERNATIVES THROUGH THE MUSTS screen of the Decision Analysis screen sequence;

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Fig. 26 shows the COMPARE ALTERNATIVES AGAINST THE WANTS screen of the Decision Analysis screen sequence;

Fig. 27 shows the IDENTIFY ADVERSE CONSEQUENCES screen of the Decision Analysis screen sequence;

Fig. 28 shows the MAKE THE BEST BALANCED CHOICE screen of the Decision Analysis screen sequence;

Fig. 29 shows the IMPLEMENT DECISION screen of the Decision Analysis screen sequence;

Fig. 30 shows the DEVELOP A PLAN screen of the Potential Problem Analysis screen sequence;

Fig. 31 shows the LIST POTENTIAL PROBLEMS screen of the Potential Problem Analysis screen sequence;

Fig. 32 shows the ASSESS THREATS screen of the Potential Problem Analysis screen sequence;

Fig. 33 shows the CONSIDER LIKELY CAUSES screen of the Potential Problem Analysis screen sequence;

Fig. 34 shows the TAKING PREVENTATIVE ACTION screen of the Potential Problem Analysis screen sequence;

Fig. 35 shows the TAKING CONTINGENT ACTION screen of the Potential Problem Analysis screen sequence;

Fig. 36 shows the MODIFY PLAN screen of the Potential Problem Analysis screen sequence;

Fig. 37 shows the ACTION TRACKER screen;

Fig. 38 shows the situation appraisal knowledge base ER diagram;

Fig. 39 shows the problem analysis knowledge base ER diagram;

Fig. 40 shows the decision analysis knowledge base ER diagram;

Fig. 41 shows the potential problem analysis knowledge base ER diagram;

Fig. 41a shows the potential opportunity analysis base ER diagram;

Fig. 42 shows the action tracker knowledge base ER diagram;

Fig. 43 shows the general process screen sequence class inheritance graph;

Figs. 44a-44c show the situation appraisal class inheritance graph;

Figs. 45a-45d show the problem analysis class inheritance graph;

Fig. 46 shows the decision analysis class inheritance graph;

Fig. 47 shows the potential problem analysis class inheritance graph;

Fig. 47a shows the potential opportunity analysis class inheritance graph;

Fig. 48 shows the action tracker class inheritance graph;

Fig. 49 shows the DEVELOP A PLAN screen of the Potential Opportunity Analysis screen sequence;

Fig. 50 shows the LIST POTENTIAL OPPORTUNITIES screen of the Potential Opportunity Analysis screen sequence;

Fig. 51 shows the ASSESS BENEFITS screen of the Potential Opportunity Analysis screen sequence;

Fig. 52 shows the CONSIDER LIKELY CAUSES screen of the Potential Opportunity Analysis screen sequence;

Fig. 53 shows the TAKING PROMOTING ACTION screen of the Potential Opportunity Analysis screen sequence;

Fig. 54 shows the TAKING CAPITALIZING ACTION screen of the Potential Opportunity Analysis screen sequence;

Fig. 55 shows the MODIFY PLAN screen of the Potential Opportunity Analysis screen sequence;

Fig. 56 shows a GUI screen indicative of the top-level menu as illustrated in Fig. 1;

Figs. 57-73 show an alternative embodiment of the GUI screens of the situation appraisal process screen sequence;

Figs. 74-84 show a first alternative embodiment of the GUI screens of the problem analysis process screen sequence; and

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Figs. 85-137 show a second alternative embodiment of the GUI screens of the problem analysis process screen sequence.

DETAILED DESCRIPTION OF THE INVENTION

The top level functional block diagram of the complex situation assessment process screen sequences 10 as defined herein is shown in Fig. 1. Situation appraisal 12 is typically most applicable to an initial assessment and enumeration of concerns surrounding a situation. This appraisal results in an indication of which of the process screen sequences, problem analysis 14, decision analysis 16, or potential problem/opportunity analysis 18, is most applicable to a particular concern. Each of the three analysis process screen sequences 14, 16, 18 may also be invoked independently irrespective of a corresponding situation analysis. Action tracker interface 20 is available from all process screen sequences, and may also be invoked independently.

Fig. 2 shows an architectural block diagram of the system in which the situation assessment process screen sequences are invoked. Software architecture 23 as included, for example, in workstation 22 includes the process components 24 which comprise the situation appraisal, problem analysis, decision analysis, and potential problem/opportunity analysis software which drive the process screen sequences. Action tracker component 26 comprises software driving the action tracker, accessible from any of the process screen sequences. Knowledge base access and retrieval of prior situation assessment activities are performed by report writer component 28, for broad queries and retrieval of large quantities of data, and keyword query or other searching component 30, for pinpointing specific entities and situations. Other support and administrative functions are provided by

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licensing management component 32, system support component 34, and administrative component 36.

Workstation 22 is networked to remote users 38, for enterprisewide access at remote locations, and local network server 40, for accessing the knowledge base 42 to store and retrieve prior situation assessment data. Archive database 44 and client database 46 are for backup functions and enterprise specific information, respectively.

The software as described above is executed on a device such as workstation 22. In this embodiment, workstation 22 is a 32 bit microprocessor-based system such as a PENTIUM® PC and executes on a WINDOWS® (94, 98, or NT) platform or other operating system as compiled. 16 bit users may utilize commercially available extensions for use on older PCs. 32M main memory is recommended, however execution may be possible with less memory with lower performance.

The process screen sequences defined further below are point and click WINDOWS®-type graphical user interfaces common to many computer applications. Screens are scrolled through using common scroll arrow buttons, and pull-down menus may be used to jump between various screens in a particular screen sequence. A user may begin with any process screen sequence, also through a pull-down menu, although it is expected that a situation appraisal will precede one or more of the other process screen sequences. Each process screen sequence is identified by a unique process identifier or file name for later retrieval and knowledge base entry. Entry cells are either for free form entry of descriptive text, or pull-down menus to populate the field from among a list of finite choices. A user may elect either a worksheet mode or interview mode of operation. Worksheet mode is for the experienced user, and allows unprompted entry of data into the relevant fields to expedite the assessment. Interview mode is a more

structured environment which prompts the user with specific questions to elicit the proper type of data from the user. While slightly more time consuming, this mode allows a novice to produce an accurate assessment until the user is comfortable with worksheet mode. Modes may be toggled at any time. Information input by the user during interview mode is incorporated into the corresponding worksheet and vice-versa. Each of the process screen sequences outlined above are organized into deliverables called Process Application Kits (PAKs), which can be independently provided. Further, each PAK can be customized to suit a particular business focus or group of users through the COM object architecture (per MICROSOFT® Component Object Model). Additional PAKs can be developed to access the knowledge base accumulated with the process screen sequences, for example to generate project specific reports or to generate periodic reports about critical items. Throughout the process screen sequences, process checkers running in the background screen and filter data which is input by the user, thereby ensuring that complete and correct data is provided by the user throughout each screen sequence. These process checkers analyze the user input at various input points, and detect items which are likely to require refinement or correction. Constructively phrased messages are provided to the user to assist in proper correction of data entry, or to confirm that the input data is correct, along with corresponding prompts for response. In one embodiment, three process checkers are implemented, however additional checkers could be implemented to suit particular types of errors as the user base requires. Further, process checker messages may be toggled off by experienced users who do not require such assistance. An INFORMATION MISSTATED process checker employs rule-based analysis of input to detect skipped steps, unsound data, or incomplete analysis. Such messages are typically displayed as the

user attempts to advance to a next screen, after completing entry on the current screen, however could also be provided upon entry of a particularly suspect cell. A COMMON PITFALLS process checker flags areas where imprecise data will result in later difficulty, as with critical data items. Such messages are displayed prior to user input as a reminder, and do not analyze data after entry. A SHARPENER process checker assists in entry of critical fields where further prompting assists in refining the response. A series of questions is presented to the user to assist in editing the response entered in the cell. This process checker, therefore, guides the user through a series of successively narrower questions in order to pinpoint accurately the desired item of information. All process checkers may be overridden by the user once confirming that the response entered is in fact correct.

Cells as presented by the process screen sequences defined herein may be populated via direct text entry from the keyboard, or may be populated and/or supplemented by attaching an external file. These files are stored in the knowledge base and remain associated with the particular cell or record. Such files may be MICROSOFT® Word Documents, POWER POINT® files, jpegs, bitmaps, AUTOCAD® files, or other external file appropriate to the particular cell.

Flowcharts for exemplary situation appraisal, problem analysis, decision analysis, and potential problem analysis process screen sequences are shown in Figs. 3-6. Each of the steps in the flowcharts corresponds to a specific screen in the sequences described in further detail below. Specifically, Fig. 3 shows a situation appraisal flowchart 50; Fig. 4 shows a problem analysis flowchart 52; Fig. 5 shows a decision analysis flowchart 54, and Fig. 6 shows a potential problem analysis flowchart 56.

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Software architecture is based upon various third-party toolkits and development platforms consistent with modern industry development standards to facilitate modifications and extensions. Unified Modeling Language (UML) is employed to standardize the object-oriented architecture. COM objects are provided where appropriate, to facilitate integration and modification. Rational Rose Modeler for software design, ERWin® for database modeling, and Delphi Client/Server are used to facilitate future enhancements.

SITUATION APPRAISAL

The situation appraisal screen sequence 50 provides a user interface which allows a situation to be subdivided into a set of specific concerns so that a user may graphically organize and clarify issues to be resolved. Each situation is stored in an individual situation file for later retrieval and database indexing. A situation background and theme are also provided to set the general business context and to be used as a reference or refresher for later querying and retrieval.

Once the situation file is created, the threats and opportunities screen, shown in Fig. 7, is then used to enter broad issues relating to general concerns of the situation. Users enter descriptive text for each broad issue in concern cells 100, which scroll downward to accommodate all the broad issues entered. Once complete, the ADVANCE SEQUENCE arrow button 102 is used to progress to the separate and clarify concerns screen shown in Fig. 8. Users then consider the broad issues entered in the previous screen, and clarify and refine them into distinct concerns in refined concern cells 104, removing redundant items and consolidating overlapping issues. When the modified list describes distinct refined concerns, rather than broad issues, ADVANCE SEQUENCE arrow 102 is used to progress to the concern consideration screen.

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The concern consideration screen shown in Fig. 9 allows a user to enter specific information for each of the stored refined concerns 104 stemming from a particular situation, as listed on the separate and clarify concerns screen. This provides an interface to populate various cells addressing the seriousness 106, urgency 108, and growth 110, defined further below, of a particular situation, thereby allowing computation of a priority 112 for that concern. The CONCERN CONSIDERATION screen is used to refine details of each concern. Some of these cells are further subdivided into a specification, for descriptive text, and a relativity field, for ranking relative to other concerns.

The priority cell 112 is computed based on the relativity fields for seriousness, urgency, and growth, described further below, to provide an overall ranking of concerns. Alternatively, this cell may be overridden by the user through priority pull-down 112.

The SERIOUSNESS cell 106 is further divided into a specification cell 126 and a relativity cell 116. Users enter descriptive text in the specification cell 126 to describe the impact the concern in question will have with respect to human resources, safety, cost, customers, productivity, reputation, and other factor which affect the enterprise. The seriousness relativity cell 116 is for entering a discrete ranking of magnitude relative to the seriousness of other concerns. A ranking hierarchy such as high (H), medium (M), low (L), and need more data (NMD) can be entered here through a pull-down menu similar to the priority cell, and will be displayed as well as used in calculating priority.

The URGENCY cell 108 also has two components, a specification cell 128 and a relativity cell 118. The urgency specification cell 128 is for descriptive text directed to determining when resolution of this concern would become difficult, expensive, or impossible. The

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urgency relativity cell 118 is for entering a discrete ranking of magnitude relative to the urgency of other concerns, similar to the priority cell pull-down.

The GROWTH cell also has specification and relativity components. Specification cell 130 is for descriptive text directed to determining the evidence that the seriousness of the concern will grow. The growth relativity cell 120 is for entering a discrete ranking relative to growth potential of other concerns, similar to the priority cell pull-down. High (H) indicates that the growth potential is increasing, medium (M) indicates that the growth potential is stable, and low (L) indicates that growth is decreasing. Need more data (NMD) may also be entered.

Once all concerns 104 relevant to the situation are entered, screen sequence button 102 is used to advance to the determine analysis needed screen in Fig. 10. For each concern entered, five clarifying cells are provided: PRIORITY, SERIOUSNESS, URGENCY, GROWTH, and PROCESS. Each concern cell entered on the previous screen is displayed, along with a PROCESS cell 140 for each concern. PROCESS cell also has specification 144 and a relativity components 142. Process relativity cell 142 is for entering the specific process sequences, described further below, that should be used to address each concern, and is selected by pull-down menu 146. A problem analysis sequence should be undertaken if the concern is directed to the cause of why a particular event or occurrence happened. A decision analysis sequence should be undertaken if the concern is directed to determining the course of action that should be pursued to address the concern. A potential problem analysis should be undertaken if the concern is directed to predicting future occurrences or events and possible remedial action to be taken. A further situation appraisal should be undertaken if the concern is too broad to be adequately addressed by the problem, decision, or potential problem analysis sequences.

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After an analysis is selected for each concern, the DETERMINE HELP NEEDED screen (Fig. 11) is used to identify specific individuals or groups to execute the analysis determined in the previous screen and to identify the specific objective of the analysis. The DETERMINE HELP NEEDED screen has a PROCESS section 150, which echoes information from the DETERMINE ANALYSIS screen, and an ASSIGNMENT section 152, for specifying involvement of other people. The ASSIGNMENT section 152 is integrated with the action tracker, described further below, which provides scheduling for all screen sequences. ACTION cell 154 is used to enter descriptive text for the task and objective. This task is generally an "analysis" from the determine analysis screen, or other task for addressing a particular concern. WHO cell 156 is a pull-down menu of names for assignment to the analysis, and also allows for entry of new names. WHEN cell 158 indicates the completion date of the analysis. NOTES cell 160 is a descriptive text cell which can contain clarifying or specification information of the analysis, such as product, assembly line, or plant location. STATUS cell 162 is used to describe the current state of the task, and is a pull-down with the options not started, action assigned, cancelled, on hold, cause confirmed. Other status cell values may be entered. Sort pull-down 164 allows sorting by any of the ASSIGNMENT section cells. The result of this process screen sequence is that the user is provided with an indication of which of the analysis process screen sequences, problem, decision, or potential problem, are most applicable to the concern in question, as described further below.

PROBLEM ANALYSIS

The problem analysis screen sequence provides a user interface which allows a problem to be subdivided into a set of statements which describe various aspects of the problem and what they are and are not, creating a concise,

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accurate problem specification. These statements are then assigned possible causes. The possible causes are then evaluated to determine the most probable cause and verify the most probable cause to determine of it is the true cause.

A problem background statement concerning the context is read from the situation appraisal file to which this problem analysis corresponds. This statement may be edited by the user or alternately, entered entirely by the user. This problem background statement is then stored in an individual problem analysis file for later retrieval and database indexing.

Referring to Fig. 12, the STATE THE PROBLEM screen is used to enter a statement of normal operation in the SHOULD BE HAPPENING cell 200 to describe what the object of the problem should be doing when performing properly. ACTUALLY HAPPENING cell 202 is then used to enter a perceived problem, which is the current condition of the object that is believed to be, or have, the problem. User then selects the applicable cause known/unknown button. If the cause is known, button 211 is selected, and the user is prompted that a problem analysis is not appropriate and an alternate screen sequence, such as decision analysis, may be applied. If the cause is not known, button 210 is selected, and the object of the problem is then entered in OBJECT cell 206, such as "motor", "assembly line five", or "Boston office". The DEVIATION cell 208 is used to enter the deviation from normal operation, such as "cracked housing" or "sales down ten percent".

The user then advances to the SPECIFY THE PROBLEM screen, for example as shown in Fig. 13, to enter specific statements of fact concerning the problem. A concise problem statement 212 from the object 206 and deviation 208 cells is carried over from the previous screen, and is the concatenation of the object and deviation cells to form a statement such as "Boston office sales down ten percent."

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Eleven descriptor question cells 214 are provided (not all shown due to scroll down display), however fewer or additional statement cells could also be used. Collectively, these descriptor question cells are for describing the problem in terms of four domains: what, where, when, and extent. The eleven descriptor question cells 214 are for entering information to address the following: problem object, problem deviation, geographical variance or location, location of the deviation on the problem object, first problem (deviation) occurrence, most recent or subsequent problem (deviation) occurrence, problem cycle (during lifecycle history of object), number of problem objects (how many objects have/do not have the deviation), size of problem (magnitude of a single deviation), number of problem deviations (how many deviations on each object), and problem trend (how it is/is not progressing). For each descriptor cell, two subfields are provided. In each subfield, for each of the eleven descriptors, the user enters descriptive text directed to what the problem is 216 and is not 218. The IS descriptor subfield is for accurately refining and narrowing the object that has the deviation. The IS NOT descriptor subfield is for indicating which other closely related entities could have the deviation, but do not. By defining both the IS and IS NOT subfields, the responses in these cells serve to establish clear boundaries around the problem. Additional descriptor question cells for a particular descriptor question may be added by clicking on insert button 220 if needed to accurately refine the problem. For example, WHAT OBJECT descriptor 222 might further clarify specific product packaging that is and is not experiencing the deviation, and also might indicate which assembly lines are affected. Other comparative designators may be used in place of "is" and "is not".

Following entry of the IS/IS NOT descriptor cells, the user advances to one of two screens. The user may advance

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to the USE DISTINCTIONS AND CHANGES screen shown in Fig. 14, which provides cells for entering distinctions between each of the IS/IS not descriptors entered previously. These distinction fields assist in entering possible causes (Fig. 15). Alternatively, if the user prefers using their own knowledge and experience, they may advance directly to the STATE POSSIBLE CAUSES screen.

The USE DISTINCTION AND CHANGES screen (Fig. 14) presents the user with the previously entered problem statement 212 and descriptor question cells 214, and provides, for each descriptor question, DISTINCTION 224 and CHANGE 226 cells. These DISTINCTION and CHANGE cells are for entering descriptive text to identify the distinctive features concerning the "IS" data 216 relative to the "IS NOT" data 218, for each of the descriptor questions 214. The information in these cells assists in identifying possible causes in the subsequent state possible causes screen (Fig. 15). Users enter distinctive features for each is/is not pair in DISTINCTION cells 224. Multiple distinctive features may be entered by clicking insert button 228 to insert a DISTINCTION cell. Not all descriptor IS/IS NOT cells need be populated, however a distinction may not be entered unless the corresponding descriptor question cells are populated. Descriptor IS/IS NOT cells may be entered here as well.

For each DISTINCTION cell 224, descriptive text concerning changes are entered in CHANGE cells 226. Such changes may be those that have occurred in, on, around, or about each distinction, in order to identify possible causes. Other changes may also be used. As with DISTINCTIONS 224, multiple change cells may be entered for each distinction by clicking the INSERT CHANGE button 230.

The user next advances to the STATE POSSIBLE CAUSES screen shown in Fig. 15. This screen has two formats depending on whether the user has elected to enter distinctions and changes. Fig. 15 shows the STATE POSSIBLE

CAUSES screen with the DISTINCTION and CHANGE cells 224, 226 echoed. If the user has not entered distinctions and changes, the descriptor question cells 214 and IS/IS NOT responses 216, 218 are displayed. For either screen descriptive text is entered in possible CAUSE cells based upon the information in the DISTINCTION/CHANGE cells 224, 226 or is/is not responses 216, 218, as applicable. The most effective possible causes tend to be provided by cross-correlating the eleven different descriptor questions to find common denominators and items which are mutually exclusive. Additional possible cause cells may be added through INSERT POSSIBLE CAUSE button 234.

Upon entry of POSSIBLE CAUSE cells 232, the user advances to the test possible causes against specification screen shown in Fig. 16. This screen presents possible causes one at a time in POSSIBLE CAUSE cell 236. The possible cause selection buttons 238 are used to scroll through the list of previously entered possible causes. The problem statement 212 is echoed here, as well as the descriptor questions 214 and responses 216, 218. A CONDITIONS 240 cell and an ASSUMPTIONS cell 242 are provided for user input. For each possible cause 236, users scan the list of descriptor questions 214. For each descriptor question, conditions 240 under which the possible cause would prove or disprove the descriptor question are entered. Conditions are entered under prefixes such as "ONLY IF", "YES BECAUSE", and "NO BECAUSE" via condition pull-down 244. Assumptions pertinent to the basic condition are then entered in ASSUMPTIONS/NOTES cell 242. An "ONLY IF" assumption specifies the specific circumstances under which the possible cause would explain the particular descriptor question 214. A "YES BECAUSE" assumption explains why the possible cause would explain the particular descriptor question. A "NO BECAUSE" assumption explains why the possible cause could not explain the particular descriptor question 214, and

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eliminates the possible cause 236 from the list. Conditions may be limited to three options to facilitate later sorting and processing of the possible causes to determine the true cause or causes, described below. Such an eliminated possible cause, however, and the associated assumption, is nonetheless retained in the knowledge base for subsequent queries, described further below with respect to the knowledge base query engine. Multiple ASSUMPTIONS/NOTES cells 242 needed to explain a particular descriptor question may be entered through INSERT ASSUMPTION button 246.

Following the entry of conditional assumptions, positive cause notes, and elimination of a subset of the causes, the DETERMINE MOST PROBABLE cause screen is called (Fig. 17). At this point the list of possible causes has been narrowed due to elimination of the possible causes resulting in a "NO BECAUSE" condition test, above. This screen presents remaining assumptions entered on the TEST POSSIBLE CAUSES screen (Fig. 16) in an ASSUMPTION cell 242, alongside the corresponding POSSIBLE CAUSE cell 236. For a listed possible cause, probability pull-down 247 may be used to assign a probability cell 248 from among: MPC (most probable cause, high (consider next), medium (also verify) and low (consider later). The ASSUMPTION cells 242 and POSSIBLE CAUSE cells 236 are sorted according to the probability 248 and the condition (244, Fig. 16) for use in the next screen.

The GATHER FACTS TO VERIFY THE TRUE CAUSE screen (Fig. 18) is then presented. Low probability possible causes are not carried over onto this screen, however such causes and assumptions are nonetheless stored in the knowledge base for later query use. The remaining possible causes and their respective assumptions are displayed in their respective cells 236, 246. Individual possible causes are considered by the user in a scrolling format which allows the user to advance through scroll buttons 248 from most

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probable to the "ALSO VERIFY" possible causes. For each possible cause 236 presented, ACTION TRACKER cells 250 are used to enter actions needed to resolve the possible cause 236 and the accompanying assumptions 246. ACTION cell 252 is for descriptive text indicative of the specific test, activity, or question to be undertaken in order to confirm or deny a particular possible cause and the assumptions associated therewith. WHO cell 254 is for indicating the person or group responsible for the action, and WHEN cell 256 is for a completion date. NOTES cell 258 allows entry of descriptive text concerning other aspects of the action.

ACTION TRACKER cells 250 are integrated with the action tracker, described further below, which is integrated with the other process screen sequences as defined herein. In this manner, a concise itemization of the actions required to address a particular possible cause can be entered, stored in the knowledge base, and later searched and retrieved through the query engine, in addition to being codified for tracking the present problem. The query engine, described further below, may also be invoked to search for similar possible causes in the knowledge base. Resolution of the action items should then focus and refine the remaining possible causes to determine the true cause.

Fig. 19 shows the THINK BEYOND THE FIX SCREEN for entering data to enumerate ramifications of the actions just entered. This information may be useful in the potential problem analysis process screen sequence, described further below.

DECISION ANALYSIS

A situation appraisal, as described above, may also indicate that a decision analysis is warranted. A decision analysis, as described further below, allows a user to populate cells specifying objective aspects of the decision, and use these cells for reporting and querying of

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the knowledge base to provide a graphical verification and record that all aspects concerning a particular decision were considered. The screens presented in the decision analysis screen sequence allow a user to populate cells focused on the objective of the decision, the alternatives which strive towards achieving that objective, risks associated with each alternative, and on selecting the final decision from among the alternatives.

Each decision analysis screen sequence is stored in a unique file to facilitate later indexing, searching and retrieval from the knowledge base. A previous or in process decision analysis can be selected for modification by the user, or a new decision analysis screen sequence may be entered.

Referring to Fig. 20, the STATE THE DECISION screen is shown. The DECISION BACKGROUND cell 300 is for descriptive text concerning the context and other data about the situation. Alternatively, this cell may be populated from a situation appraisal or action tracker sequence which raised this decision analysis. Next, a DECISION STATEMENT is entered in the decision statement cell 302. The decision statement should clarify the fundamental purpose of the decision, the intended result, and should set the scope of boundaries of the alternatives which will be considered. An overly broad decision statement may purport to provide a far reaching solution, but may also prove difficult to enumerate alternatives for, as will be described below, and may not provide informative value during future queries of the knowledge base.

Once the decision statement is entered, the user advances to the DEVELOP OBJECTIVE screen (Fig. 21). The DECISION STATEMENT cell 302 is echoed here, and additional cells for objectives 304 and notes 306 are provided. An INSERT OBJECTIVE button 308 allows entry of additional objectives. Using the DECISION STATEMENT 302 as a reference, the user enters descriptive text in the

OBJECTIVES cells 304 to indicate particular results to be achieved. Objectives, both short and long term and of varying priorities and constraints, are entered at this point to robustly populate the knowledge base. The criteria to measure the objective should be clear. Refinement occurs at a later screen. Notes concerning constraints, priority, or other aspects concerning this objective may be entered in NOTES cell 306.

After listing the objectives, the CLASSIFY OBJECTIVES screen, shown in Fig. 22, is displayed. This screen echoes the DECISION STATEMENT 302, and lists each OBJECTIVE and NOTES cell 304, 306 for review by the user. For each objective, a CLASSIFICATION cell 310 is provided. The user scans the objectives, and for each listed objective enters a classification of MUST or WANT, or other descriptive classification, in CLASSIFICATION cell 310 using pull-down menu 312. Objectives that are mandatory, measurable with a finite limit, and realistic should receive a classification value of MUST. Others that may be desirable should receive a classification value of WANT. Not all CLASSIFICATION cells need be entered; a default value of WANT is then assigned. Additional objectives may also be added at this screen by clicking INSERT OBJECTIVES button 308. In this manner the objectives sought by the decision are ranked into groups representing objectives such as uncompromisable and optional.

Next, the user advances to WEIGHT THE WANTS screen (Fig.23) to further classify the optional WANT objectives. Below the DECISION STATEMENT cell, each OBJECTIVE cell 304 is displayed adjacent a WEIGHT cell 314. NOTES cell 306, corresponding to each objective, is also displayed, and may be further modified with descriptive text. Each OBJECTIVES cell 304 is further subdivided into a descriptive portion 316 and a relative weight portion 318. The relative weight portion may be implemented as a slide bar 320. For each WANT objective, the user determines a relative priority

weight. The most compelling objective is assigned a value of ten on a zero to ten scale, however the upper limit could be varied to suit the granularity desired as can the scale itself. The user then considers each remaining objective and assigns a relative weight accordingly.

Following the WEIGHT THE WANTS screen, the user progresses to the generate alternatives screen shown in Fig. 24. This screen is for generating alternatives based on the previously entered objectives. MUST and WANT objectives are displayed in MUST OBJECTIVES cell 322 and WANT OBJECTIVES cell 324. Want objectives may be sorted by relative weight cell 318 value, or may remain in the order entered. The user scrolls through the MUST and WANT objectives to generate alternatives, and enters these alternatives in ALTERNATIVE cell 326. The user may scroll through the objectives in any order. However, considering the MUST objectives first ensures that mandatory items are reflected in the resulting alternatives list. Additionally, users may query the knowledge base for previously entered alternatives using query engine, described further below. Additional alternatives may be entered by clicking INSERT ALTERNATIVES button 328. Objectives may also be added by clicking insert MUST OBJECTIVE button 330 and insert WANT OBJECTIVE button 332. Once all alternatives are entered, the user advances to the screen alternatives through the musts screen, shown in Fig. 25, to refine and narrow the entered alternatives.

On screen alternatives through the MUSTS screen (Fig. 25), the MUST OBJECTIVES 322 and the ALTERNATIVES 326 are displayed in a matrix form for review and selection. Scroll bars 336 and 334 can be used for horizontal scrolling through the alternatives and vertical scrolling through the must objectives, respectively. A FEASIBILITY cell 338 is therefore provided corresponding to each alternative and must objective. Descriptive text to describe how an alternative does or does not meet a must

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objective is entered by the user in descriptive portion 340. Each FEASIBILITY cell 338 also has a GO/NO GO toggle button 342 to provide a discrete indication of whether an alternative satisfies a particular must objective. An alternative with even one "no go" attributed to it is deemed eliminated and is not carried forward. However, it will be retained in the knowledge base for later query and retrieval.

Following consideration of MUST objectives, the COMPARE ALTERNATIVES AGAINST THE WANTS screen (Fig. 26) is entered. This screen is provides a WANT ALTERNATIVE slider 344 to rank alternatives, such as on a 1-10 scale, rather than a discrete GO/NO GO toggle. Previously entered want weight 318 is also displayed for reference. For each want objective/alternative combination, a FEASIBILITY cell 340 is provided to describe the alternative with respect to the objective. Each WANT OBJECTIVE 304 is compared to ALTERNATIVES 326. The alternative which best satisfies the want objective receives a score 346 value of ten, or highest, using slider 344. The other alternatives for that WANT OBJECTIVE 324 are scored relative to the alternative which received the score of ten.

Once the ALTERNATIVES 326 are scored, a weighted score for each objective 324 is computed and displayed. The weighted score is the result of the weight value assigned the objective multiplied by the score value assigned to this alternative. The total weighted scores then indicate which alternatives best satisfy the objectives. Also provided is a total alternative score 348 for each alternative, which serves as an indicator of the alternatives having a greater overall impact. A tentative choice button 350 is clicked to indicate which alternatives are selected by the user, which need not be the alternatives having the highest total alternative score 348.

Following the scoring of the alternatives, risks associated with each alternative selected for further evaluation are considered on the identify adverse consequences screen (Fig. 27). The remaining alternatives are displayed in descending order by total alternative score, one at a time in alternatives cell 326, along with the corresponding total alternative score cell 348. Users scroll through the alternatives carried over from the previous screen using alternative selection buttons 352. As each alternative is displayed, users identify a possible adverse consequence 353 which could result from this alternative. The user enters descriptive text in "if" cell 354 to define the condition under which the adverse consequence could occur. Probability cell 356 is a pull-down of choices such as low, medium, and high, indicative of the probability that the adverse consequence will occur. "Then" cell 358 is for descriptive text concerning the result of the adverse consequence occurring, and seriousness cell 360 is a pull-down with the options low, medium, and high indicative of the magnitude of the result should the adverse consequence occur. Notes cell 362 is for descriptive text concerning other information about the condition or result for further clarification or later query. Multiple consequences for an alternative may be entered through INSERT adverse CONSEQUENCE button 364.

Fig. 28 shows the MAKE THE BEST BALANCED CHOICE screen. This screen is used to select one alternative as a decision by displaying cells for the ADVERSE CONSEQUENCES 353 carried over from the previous screen, the total alternative score cell 348, and the want OBJECTIVES cell 324, entered previously. Mandatory "MUST" objectives have already been considered by eliminating the alternatives which do not satisfy them. Accordingly, the adverse consequence cells 353, WANT OBJECTIVE cells 324, and ALTERNATIVES cells 326, may now be scrolled through to evaluate the elements of each available alternative 326.

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Additional want objectives or adverse consequences may also be entered on this screen by clicking on INSERT WANT OBJECTIVE button 366 or INSERT ADVERSE CONSEQUENCE button 368, respectively. The chosen alternative is marked as a final decision by DECISION checkbox cell 370.

Following selection of final decision, the IMPLEMENT DECISION screen is displayed (Fig. 29). This screen displays the final decision 372 as chosen on the previous screen from the most appealing alternative 326, and further provides ACTION TRACKER cells for ACTION 376, WHO 378, WHEN 380, and NOTES 382. These cells provide input to the ACTION TRACKER, and are used similarly to the action tracker cells in the other screen sequences. Actions required to implement or complete the chosen decision are assigned to groups or individuals, scheduled, and tracked using the action tracker, described further below.

POTENTIAL PROBLEM ANALYSIS

Once a decision is made, the implementation of that decision may nonetheless encounter problems. The potential problem analysis screen sequence is used to enter and organize events and/or occurrences which may hinder the implementation of action plans. This screen sequence may be pursued following entry of ACTION TRACKER cells after a decision analysis or other process screen sequence, above, or may be undertaken alone with respect to an independent course of action.

Referring to Fig. 30, the DEVELOP A PLAN screen is shown. An action statement defining a specific and concise purpose of the action, task, or project is entered in ACTION STATEMENT cell 400. This statement may be carried over or modified from a decision analysis, or may be entered as free form text. A set of ACTION cells 402 is provided, which may be populated from an action tracker file or entered by the user. ACTION PLAN cell 404, NOTES cell 406, WHO cell 408, and WHEN cell 410 are used as in

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other process screen sequences to enter actions or tasks, clarifying notes, responsible groups or individuals, and due dates, respectively, and are described with the action tracker description below. Additional ACTION cells may be entered by clicking on INSERT ACTION button 412.

List potential problems screen (Fig. 31) is then used to view each ACTION cell 403 individually, and enter potential problems which could be raised by the specific action in POTENTIAL PROBLEMS cell 416. The POTENTIAL PROBLEMS cell allows entry of a concise statement to respond to important areas of the corresponding action. This sequence therefore allows entry of specific, concise potential problems corresponding to a particular action for later analysis. Scroll buttons 414 are used to advance through the ACTION cells 402 to review each action.

After the user has entered the potential problems for the actions, the ASSESS THREATS screen (Fig. 32) is used to identify potential problems which require the most attention, and those which are unlikely to have a serious impact. The potential problems list entered on the previous screen therefore prioritizes the list to identify potential problems requiring attention first. ACTION STATEMENT cell 400 echoes the action statement. ACTION cell 403 lists the ACTION plan 404, NOTES 406, WHO 408, and when 410 cells individually, and may be scrolled using scroll buttons 414. For each ACTION cell 403, the potential problems associated with that action are listed in POTENTIAL PROBLEM cells 416. For a potential problem, the user enters a PROBABILITY cell 418, and a SERIOUSNESS cell 420. PRIORITY cell 422 is computed based on the values of the seriousness and probability cells after potential problems have been assigned values. PROBABILITY cell 418 is a pull-down with comparative values such as low, medium, and high. For each potential problem the user evaluates the probability of occurrence and enters a value accordingly. Similarly, SERIOUSNESS cell 420 is a low,

medium, high pull-down which is set according to the magnitude of the result should the potential problem occur. In this manner, the user can identify potential problems which represent an acceptable amount of risk, and those that need to be accounted for. INSERT PROBLEM button 424 can be used to add additional potential problems.

The CONSIDER LIKELY CAUSES screen (Fig. 33) is next used to enter likely causes of each of the potential problems. Each potential problem is displayed in POTENTIAL PROBLEM cell 426, along with the corresponding PRIORITY cell 422. In this manner, the user can elect to only address potential problems having a certain priority, high or medium, for example, and deem the others to represent an acceptable risk. For each potential problem chosen to be addressed, a LIKELY CAUSE cell 428 is provided for entering a concise statement of the actions, occurrences, or other events which might result in the potential problem. Multiple likely causes may be entered for each potential problem. A CAUSE PROBABILITY cell 430 is also provided to describe the probability of the cause occurring. CAUSE PROBABILITY pull-down 432 is used to enter a comparative discrete low, medium, or high value, while PROBABILITY notes portion 434 is used for descriptive text describing the probability. Additional likely causes attributed to a potential problem may be added through INSERT LIKELY CAUSE button 436.

The TAKING PREVENTIVE ACTION screen shown in Fig.34 is then used to enter one or more PREVENTIVE ACTION cells 438 corresponding to a particular likely cause. A preventative action to serve as a barrier against the likely cause is entered in this cell 438. CAUSE PROBABILITY cell 430 from the previous screen may be used to assess more serious likely causes first, or to accept the risk of a low probability likely cause.

Despite robust preventative actions, it is may be that the chance of a likely cause occurring cannot be reduced to

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zero. TAKING CONTINGENT ACTION screen (Fig. 35) is used to enter actions which can minimize the effect if a particular potential problem nonetheless occurs. CONTINGENT ACTION cells 439 are used to enter such actions. Since such actions are only necessary if the potential problem occurs, TRIGGER cell 440 is used to specify the system, person, or event to invoke the particular contingent action. The information in TRIGGER cell 440 therefore contains information identifying the event that triggers and commences the contingent action to provide a rapid response to a particular potential problem. Additional CONTINGENT ACTION cells 439 and TRIGGER cells 440 may be added through the respective buttons 442, 444.

MODIFY PLAN screen (Fig. 36) is then used to review the action cells along with the preventative and contingent actions entered in this screen sequence. Upon finalization of the action plan, update ACTION TRACKER button 446 is used to store the information in the knowledge base where it is available to other process screen sequences as described further below with respect to the action tracker.

POTENTIAL OPPORTUNITY ANALYSIS

Once a decision is made, the implementation of that decision may provide additional opportunities. The potential opportunity analysis screen sequence is used to enter and organize events and/or occurrences which may offer opportunities in the implementation of action plans. This screen sequence may be pursued following entry of ACTION TRACKER cells following a decision analysis or other process screen sequence, above, or may be undertaken alone with respect to an independent course of action.

Referring to Fig. 49, the DEVELOP A PLAN screen is shown. An action statement defining a specific and concise purpose of the action, task, or project is entered in ACTION STATEMENT cell 900. This statement may be carried over or modified from a decision analysis, or may be

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entered as free form text. A set of ACTION cells 902 is provided, which may be populated from an action tracker file or entered by the user. ACTION PLAN cell 904, NOTES cell 906, WHO cell 908, and WHEN cell 910 are used as in other process screen sequences to enter actions or tasks, clarifying notes, responsible groups or individuals, and due dates, respectively, and are described with the action tracker description below. Additional ACTION cells may be entered by clicking on INSERT ACTION button 912.

List potential opportunities screen (Fig. 50) is then used to view each ACTION cell 903 individually, and enter potential opportunities which could be raised by the specific action in POTENTIAL OPPORTUNITIES cell 916. The POTENTIAL OPPORTUNITIES cell allows entry of a concise statement to respond to important areas of the corresponding action. This sequence therefore allows entry of specific, concise potential opportunities corresponding to a particular action for later analysis. Scroll buttons 914 are used to advance through the ACTION cells 902 to review each action.

After the user has entered the potential opportunities for the actions, the ASSESS BENEFITS screen (Fig. 51) is used to identify potential opportunities which offer the greatest benefit, and those which are unlikely to have an opportunistic impact. The potential opportunities list entered on the previous screen therefore prioritizes the list to identify potential opportunities requiring attention first. ACTION STATEMENT cell 900 echoes the action statement. ACTION cell 903 lists the ACTION plan 904, NOTES 906, WHO 908, and when 910 cells individually, and may be scrolled using scroll buttons 914. For each ACTION cell 903, the potential opportunities associated with that action are listed in POTENTIAL OPPORTUNITY cells 916. For each potential opportunity, the user enters a PROBABILITY cell 918, and a SERIOUSNESS cell 920. PRIORITY cell 922 is computed based on the values of the benefit and

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probability cells after potential opportunities have been assigned values. PROBABILITY cell 918 is a pull-down with comparative values such as low, medium, and high. For each potential problem the user evaluates the probability of occurrence and enters a value accordingly. Similarly, BENEFIT cell 920 is a low, medium, high pull-down which is set according to the magnitude of the result should the potential opportunity occur. In this manner, the user can identify potential opportunities which represent an acceptable amount of benefit, and those that need to be acted upon. INSERT OPPORTUNITY button 924 can be used to add additional potential opportunities.

The CONSIDER LIKELY CAUSES screen (Fig. 52) is next used to enter likely causes of each of the potential opportunities. Each potential opportunity is displayed in POTENTIAL OPPORTUNITY cell 926, along with the corresponding PRIORITY cell 922. In this manner, the user can elect to only address potential opportunities having a certain priority, high or medium, for example, and deem the others to represent a lower priority benefit. For each potential opportunity chosen to be addressed, a LIKELY CAUSE cell 928 is provided for entering a concise statement of the actions, occurrences, or other events which might result in the potential opportunity. Multiple likely causes may be entered for each potential problem opportunity. A CAUSE PROBABILITY cell 930 is also provided to describe the probability of the cause occurring. CAUSE PROBABILITY pull-down 932 is used to enter a discrete comparative value such as low, medium, or high, while PROBABILITY notes portion 934 is used for descriptive text describing the probability. Additional likely causes attributed to a potential problem may be added through INSERT LIKELY CAUSE button 936.

The TAKING PROMOTING ACTION screen shown in Fig. 53 is then used to enter one or more PROMOTING ACTION cells 938 corresponding to a particular likely cause. A promoting

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action to serve as a barrier against the likely cause is entered in this cell 938. CAUSE PROBABILITY cell 930 from the previous screen may be used to assess higher benefit likely causes first, or to no longer consider a low probability likely cause.

Despite robust promoting actions, it is unlikely that the chance of a likely cause occurring can be increased to be a certainty. TAKING CAPITALIZING ACTION screen (Fig. 54) is used to enter actions which can maximize the effect if a particular potential opportunity occurs, whether caused by the promoting action or not. CAPITALIZING ACTION cells 939 are used to enter such actions. Since such actions are only necessary if the potential opportunity occurs, TRIGGER cell 940 is used to specify the system, person, or event to invoke the particular capitalizing action. The information in TRIGGER cell 940 therefore provides an enumeration to provide a rapid response to a particular potential opportunity. Additional CAPITALIZING ACTION cells 939 and TRIGGER cells 940 may be added through the respective buttons 942, 944.

When the capitalizing actions and triggers have been identified, it is often necessary to take preparatory actions that set the capitalizing actions and/or triggers in place before the potential opportunity might occur, and to remove the capitalizing actions and triggers after the potential opportunity could no longer occur.

MODIFY PLAN screen (Fig. 55) is then used to review the action cells along with the promoting and capitalizing actions entered in this screen sequence. Upon finalization of the action plan, update ACTION TRACKER button 946 is used to store the information in the knowledge base where it is available to other process screen sequences as described further below with respect to the action tracker.

ACTION TRACKER

The action tracker interface is used to store, identify and compare tasks, responsible individuals or groups, due dates, and other logistical information associated with the various process screen sequence defined herein. The action tracker can be updated directly, or through action tracker data entered during the process screen sequences. Referring to Fig. 37, the ACTION TRACKER master screen is shown. This screen is similar to the ACTION TRACKER entry screen in the other process screen sequences. ACTION FILE cell 500 is used to select a previously entered action file for review and/or update. Action files on users systems across the network are listed here for various action files resulting from the process screen sequences described above. In this manner, enterprisewide monitoring of the various process screen sequences being undertaken is provided. REFRESH button 503 can be used to update the action tracker master screen with any new information entered by a user concerning a process screen sequence.

CONCERN cells 502 in the ACTION FILE 504, that can also be implemented in the other processes, list the concerns stored in the ACTION FILE 504 selected. Each concern is evaluated by criteria such as: urgency, growth, and seriousness, and is specified along a scale through a pull-down menu. A fourth cell, PRIORITY, is computed based on the values of the other three. SERIOUSNESS cell 506 is for entering a discrete ranking of magnitude relative to the seriousness of other concerns, and has a value of High (H), medium (M), low (L), and need more data (NMD). URGENCY cell 508 is rated based on a determination of when resolution of this concern would become difficult, expensive, or impossible, and has a value of low, medium, or high. GROWTH cell 510 is for indicating the potential that the seriousness of the concern will grow. PROCESS cell 512 is for specifying which of the process screen

sequences applies to this concern: situation appraisal, problem analysis, decision analysis, or potential problem analysis. CONCERN SORT pull-down 514 allows the CONCERNS 502 from the action file to be sorted by various fields such as concern, process, or priority. VIEW BY pull-down 527 allows a user to view all concerns in the action file, or only those specific to a certain individual, such as all concerns to which the user is attributed an action.

Clicking on a CONCERN cell 502 displays all actions currently entered for that concern in the ACTION cells 516, for review and/or modification. Additional actions may be added to those uploaded from the action file. WHO cell 518 specifies the group or individuals responsible for executing the task specified in the action cell, and may be modified through a pull-down list of names and groups. Multiple names may be entered, and new names not in the pull-down may be added. WHEN cell 520 indicates the expected completion date of the action. STATUS cell 524 provides a discrete indication of milestones reached concerning the action, such as not started, in progress, late, action assigned, cancelled, on hold, cause confirmed. Additional status milestones may be added. NOTES cell 522 contains descriptive text concerning other information. ACTION SORT pull-down 526 allows the listed actions to be sorted by various fields such as ACTION, WHO, WHEN, NOTES, or STATUS. Actions may automatically be mailed electronically to others, including to recipients who are not users of the system. Alternative screen formats for the various GUI screens disclosed herein are listed in Figs. 56-137.

KNOWLEDGE BASE STRUCTURE

An entity-relationship (ER) diagram of the knowledge base accumulated through the various process screen sequences as defined herein is shown in Figs. 38-42. In addition, the knowledge base links process applications and

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tracks changes made on a user-by-user basis.

Situation appraisal ER diagram is shown in Fig. 38, and contains cells for storing the information entered in the cells during the situation appraisal process screen sequence. CONCERN 600, PRIORITY 602, and the PROCESS 604 to be used for further analysis are stored in refined CONCERN entity 606. ACTION TRACKER cells WHO 608, ACTION 610, and WHEN 612 are stored in INVOLVEMENT entity 614.

Fig. 39 shows the problem analysis ER diagram, and contains cells pertinent to the problem analysis process screen sequence. SHOULD BE HAPPENING 616, ACTUALLY HAPPENING 618, OBJECT 620, and DEVIATION 622 are stored in PROBLEM entity 624. IS/IS not cells are stored in RESPONSE entity 626. DISTINCTIONS 628 are stored in DISTINCTIONS entity 630. CHANGES 632 are stored in CHANGES entity 634. POSSIBLE CAUSES 636 are stored in PROBABLE CAUSES entity 638. CONDITIONS AND ASSUMPTIONS 640 are stored in TEST RESPONSES entity 642. CONFIRMED TRUE CAUSE 644 is stored in BEYOND FIX 646. ACTION TRACKER cells are stored in CAUSE ACTIONS entity 648.

Fig. 40 shows the decision analysis ER diagram. BACKGROUND 650 and STATEMENT 652 are stored in DECISION ENTITY 654. SCORES 656 for the various alternatives are stored in ALTERN 658.

Potential problem analysis ER diagram is shown in Fig. 41. POTENTIAL PROBLEM 660, SERIOUSNESS 664, and PROBABILITY 662 are stored in SPECIFICATION entity 666. LIKELY CAUSES 668 are stored in CAUSE entity 670. PREVENTATIVE ACTIONS 672 are stored in PREVENT ACTION entity 674. CONTINGENT ACTIONS 676 are stored in CONTINGENCY ACTION 678 entity, and corresponding TRIGGERS 680 are stored in TRIGGER entity 682.

Potential opportunity analysis ER diagram is shown in Fig. 41a, and is similar in structure to the potential problem analysis ER diagram shown in Fig. 41. Potential opportunity 660a, benefit 664a, and probability 662a are

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stored in SPECIFICATION entity 666a. Likely causes 668a are stored in CAUSE entity 670a. PROMOTING ACTIONS 672a are stored in PROMOTE ACTION entity 674a. Capitalizing actions 676a are stored in CAPITALIZING ACTION 678a entity, and corresponding triggers 680a are stored in TRIGGER entity 682a.

Fig. 42 shows the action tracker ER diagram. CONCERNS 684, SERIOUSNESS 686, URGENCY, 688, GROWTH 690, and PRIORITY 692 are stored in CONCERNS entity 694. ACTIONS 696, WHO 698, WHEN 700, NOTES 704, and STATUS 702 are stored in ITEMS entity 706.

The knowledge base as described above is populated with cells entered in the corresponding process screen sequences. This knowledge base may be queried during current process screen sequences to draw upon knowledge obtained from prior process screen sequences. Such queries and reports are through a standard SQL interface, and may be broad report-based statistical information, or specific keyword queries to pinpoint a specific process screen sequence. Such keyword queries are facilitated by the use of a master keyword table. Prior to saving any of the process screen sequences as defined herein, process records are parsed for occurrences of new keywords. New keywords not previously entered are displayed to the user, who is prompted to enter, categorize, and create associations for the keywords in the master keyword table.

These queries and reports may be predetermined, to address periodic status items such as displaying all unresolved problem analysis, or to list all decisions concerning a particular product line, or may be individual point-and-click queries using the individual knowledge base fields. An integrated database engine such as ORACLE® provides initial support for the knowledge base, however other database engines using SQL or other query language could be employed in alternative implementations or to customize an application to a particular user.

CLASS HIERARCHY

The class inheritance graphs of the complex situation assessment application as defined herein are shown in Figs. 43-48. Where applicable, connection links (A)-(N) are shown with the respective circled capital letters to indicate multiple sheet graphs.

The general process screen sequence class inheritance graph 800 is shown in Fig. 43. This graph defines the general process class common to the process screen sequences defined above. Situation appraisal inheritance graph is shown on Figs. 44a-44c. Situation class 802 is derived from the general process class, and manipulates situation background and general information. Concerns are manipulated by initial CONCERNS class 804 and REFINED CONCERNS class 806. Analysis needed is manipulated by SPECIFICATION class 808.

Referring to Figs. 45a-45d, the problem analysis inheritance graph is shown. PROBLEM ANALYSIS analysis class 810 is derived from the general PROCESS class 800 (Fig. 43). INITIATING DATA class 812 manipulates the problem object and the problem deviation. Test against SPECIFICATION class 814 manipulates is/is not information. POSSIBLE CAUSE class 816 manipulates possible causes. Changes and distinctions are handled by DISTINCTION/CHANGES pairs class 818.

Decision analysis process screen sequence class inheritance graph is shown in Fig. 46. DECISION ANALYSIS class 824 is derived from the general process class (800, Fig. 43). Objectives are manipulated by DECISION ANALYSIS OBJECTIVES class 818. Alternatives are handled by DECISION ANALYSIS ALTERNATIVES class 820. Adverse consequences are manipulated by DECISION ALTERNATIVES RISK class 822.

Fig. 47 shows the class inheritance graph for the potential problem analysis screen sequence. POTENTIAL PROBLEM ANALYSIS class 826 is derived from the general

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PROCESS class 800, and also handles the action statement. Action description, probability, and seriousness are handled by POTENTIAL PROBLEM ANALYSIS SPECIFICATION class 828. Likely causes and preventative actions are handled by the LIKELY CAUSES AND PREVENTATIVE ACTION classes 830 and 832, respectively. Contingent actions and the associated triggers are handled by CONTINGENCY ACTION and ACTION TRIGGER classes 834 and 836, respectively.

Fig. 47a shows the class inheritance graph for the potential opportunity analysis screen sequence. POTENTIAL OPPORTUNITY ANALYSIS class 826a is derived from the general PROCESS class 800a, and also handles the action statement. Action description, probability, and benefit are handled by POTENTIAL OPPORTUNITY ANALYSIS SPECIFICATION class 828a. Likely causes and promoting actions are handled by the LIKELY CAUSES AND PROMOTING ACTION classes 830a and 832a, respectively. Capitalizing actions and the associated triggers are handled by CAPITALIZING ACTION and ACTION TRIGGER classes 834a and 836a, respectively.

Action tracker inheritance graph is shown on Fig. 48. ACTION TRACKER CONCERNS class 838 manipulates concerns and the related ranking cells of seriousness, urgency, growth, and priority as defined above. Action descriptions and associated logistic scheduling data is manipulated by ACTION TRACKER ITEMS class 840.

As various extensions and modifications to the present invention, including alternate embodiments of screen layout, sequence, and input methods may be apparent to those skilled in the art, the present invention is not intended to be limited except by the following claims.

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CLAIMS

1. A method of gathering, processing, storing, and displaying information concerning a complex business situation comprising the steps of:

providing a graphical user interface for entering data concerning said complex business situation;

refining said data in a predetermined, stepwise manner through user interaction with said graphical user interface;

generating, through said stepwise manner and said graphical user interface, a list of effective actions for addressing said complex business situation; and

storing said data in an indexed and normalized form in a knowledge base adapted for structured query and retrieval in performing said steps of refining and generating.

2. A computer program product comprising computer readable program code fixed on a computer readable medium operable to receive, process, store, and display information concerning a complex business situation comprising:

computer readable program code for providing a graphical user interface for entering data concerning said complex business situation;

computer readable program code for refining said data in a predetermined, stepwise manner through user interaction with said graphical user interface;

computer readable program code for generating a list of effective actions for addressing said complex business situation through use of said computer readable program code for refining said data; and

computer readable program code for storing said data in an indexed and normalized form in a knowledge base adapted for structured query and retrieval by said

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computer readable program code for refining said data and said computer readable program code for generating said list.

3. An apparatus for gathering, processing, storing, and displaying information concerning a complex business situation comprising:

a graphical display device operable to provide a graphical user interface for entering data concerning said complex business situation;

a digital input device for entering said data;

a first memory for storing said data for indexed retrieval;

a processor for refining said data stored in said first memory in a predetermined, stepwise manner through user interaction with said graphical user interface and said digital input device;

a second memory having a set of instructions operable by said processor to generate, through said stepwise manner and said graphical user interface, a list of effective actions for addressing said complex business situation; and

a third memory operable to store said entered data and said refined data in an indexed and normalized form in a knowledge base adapted for structured query and retrieval.

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ABSTRACT OF THE DISCLOSURE

A computer software application, graphical user interface, and method for entering information concerning a complex business situation, refining such information in a stepwise manner through the interface, generating a list of effective actions for addressing such a business situation, and storing such information in a knowledge base adapted for future query and reporting use of such a complex business situations, is provided. A set of screen sequences allows entry of specific aspects of such a situation to generate an action list. A situation appraisal sequence allows entry of concerns stemming from the situation to prioritize such concerns. A problem analysis sequence allows entry of causes of a problem, and refining the causes to determine a true cause. A decision analysis sequence allows entry of alternatives concerning a decision, and refines such alternatives to determine one which suits the objective. A potential problem analysis sequence allows entry of potential problems which might occur, and refines causes and actions which mitigate or eliminate such potential problems. Such sequences provide a systematic method to gather and organize information effectively in order to resolve a complex situation, and to store such information in a knowledge base for later query and retrieval for the same or similar situations, to preserve enterprisewide knowledge and expertise.

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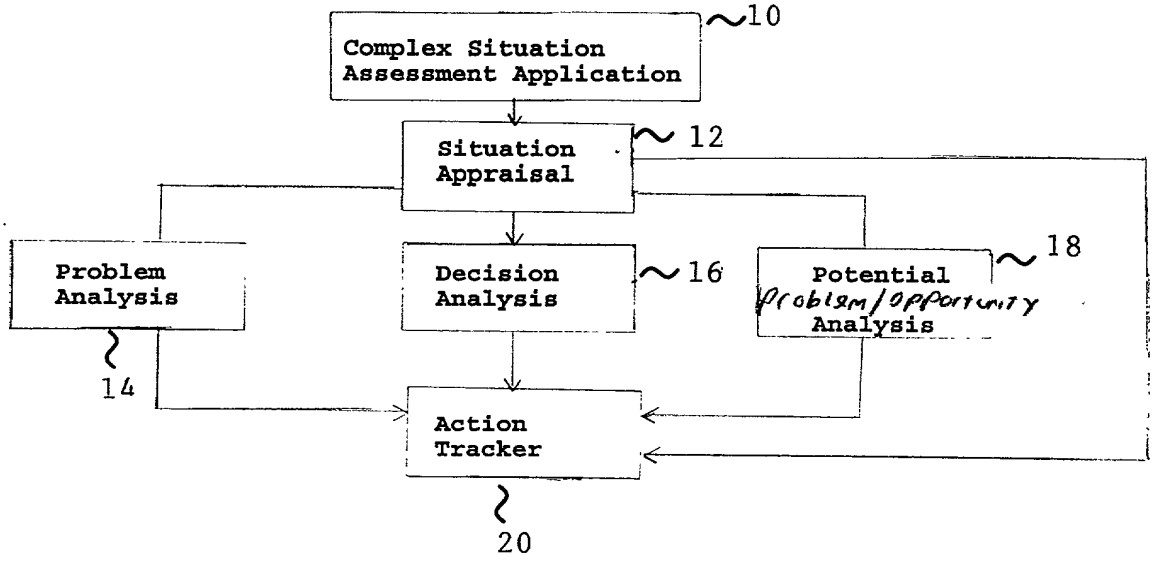


Fig. 1

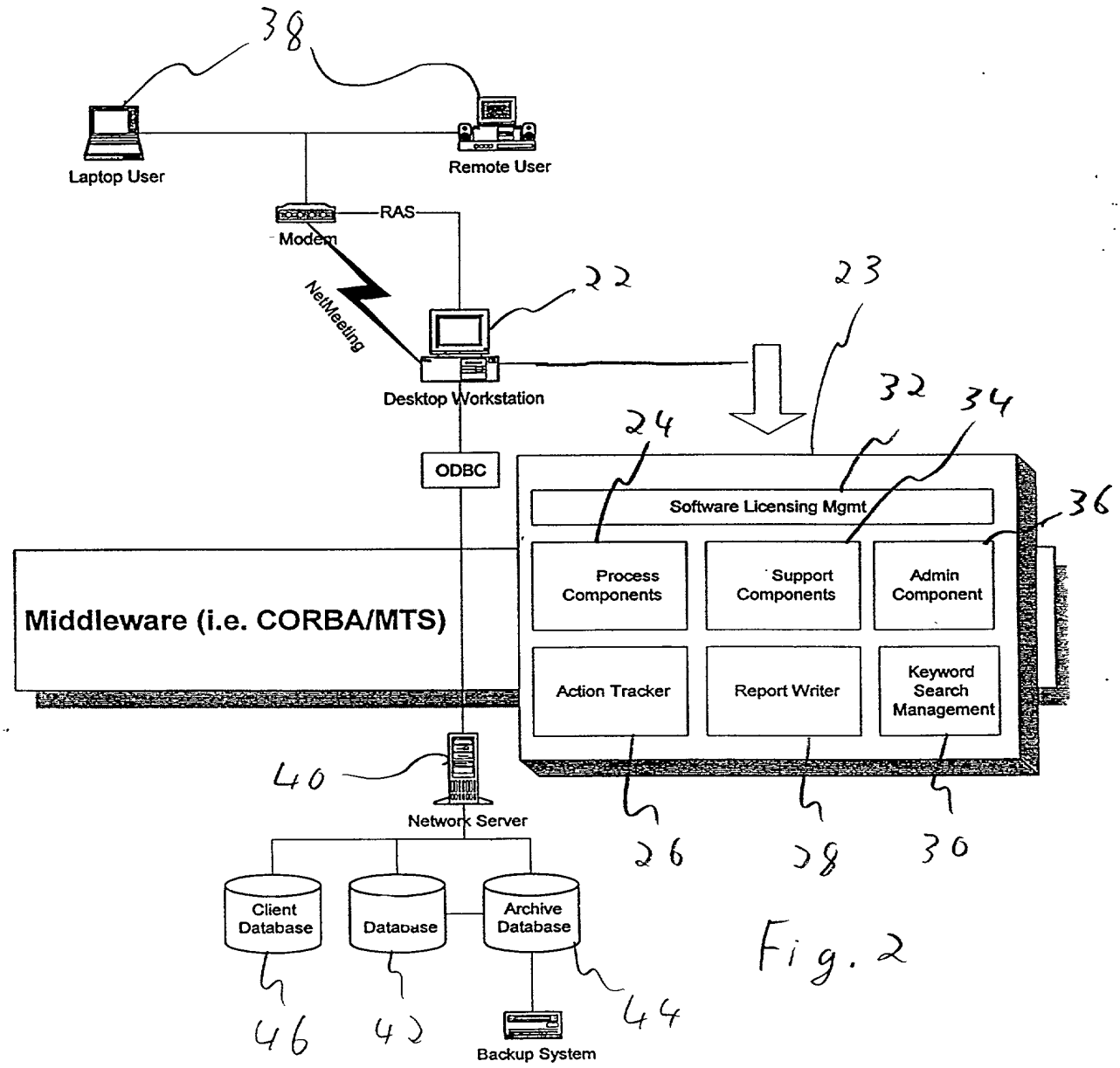

38
Laptop User
Remote User
RAS
Modem
NetMeeting
22
23
Desktop Workstation
32
34
24
ODBC
Software Licensing Mgmt
36
Middleware (i.e. CORBA/MTS)
Process Components
Support Components
Admin Component
Action Tracker
Report Writer
Keyword Search Management
40
Network Server
26
28
30
Client Database
Database
Archive Database
46
42
44
Backup System

Fig. 2

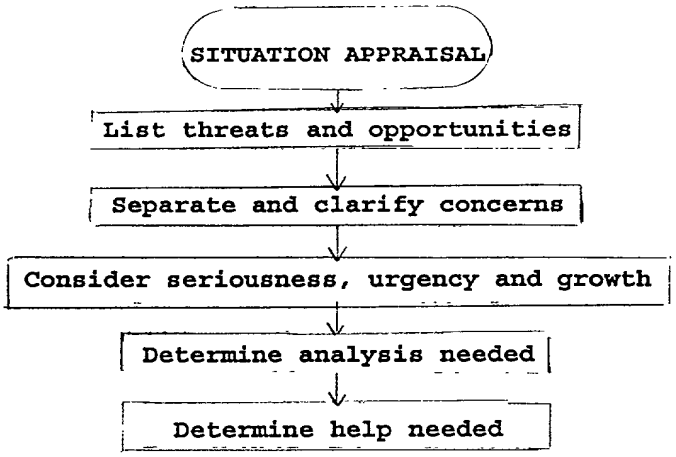

SITUATION APPRAISAL
List threats and opportunities
Separate and clarify concerns
Consider seriousness, urgency and growth
Determine analysis needed
Determine help needed
50

Fig. 3

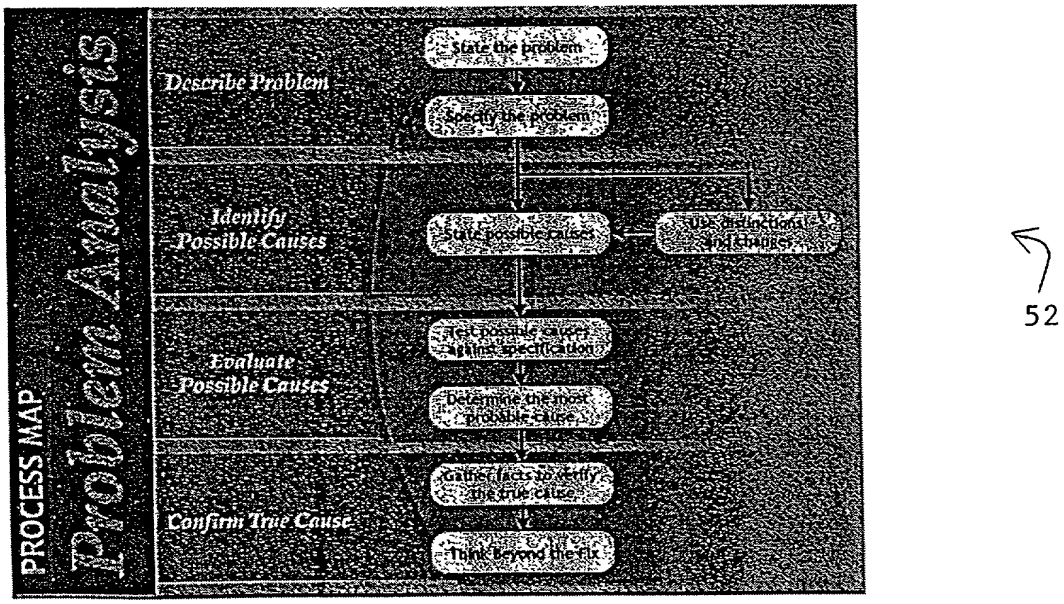

PROCESS MAP
Problem Analysis
Describe Problem
State the problem
Specify the problem
Identify Possible Causes
State possible causes
Use distinctions and changes
Evaluate Possible Causes
Test possible causes against specification
Determine the most probable cause
Confirm True Cause
Gather facts to verify the true cause
Think beyond the fix
52

Fig. 4

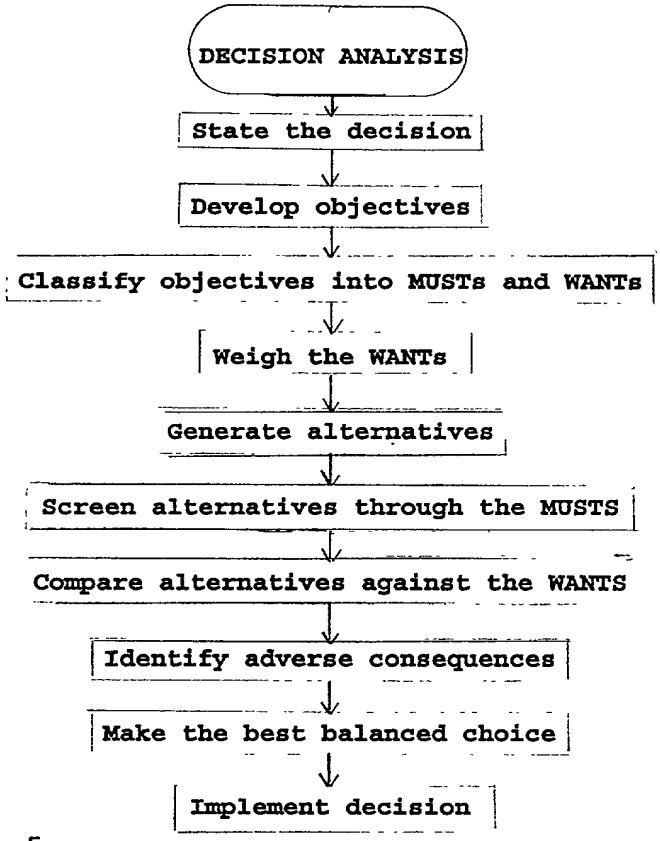

DECISION ANALYSIS
State the decision
Develop objectives
Classify objectives into MUSTs and WANTs
Weigh the WANTs
Generate alternatives
Screen alternatives through the MUSTS
Compare alternatives against the WANTS
Identify adverse consequences
Make the best balanced choice
Implement decision
54

Fig. 5

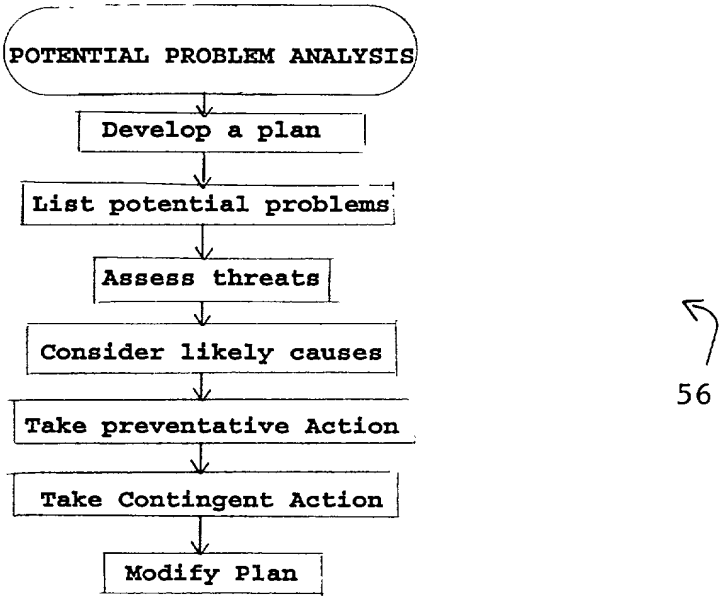

POTENTIAL PROBLEM ANALYSIS
Develop a plan
List potential problems
Assess threats
Consider likely causes
Take preventative Action
Take Contingent Action
Modify Plan
56

Fig. 6

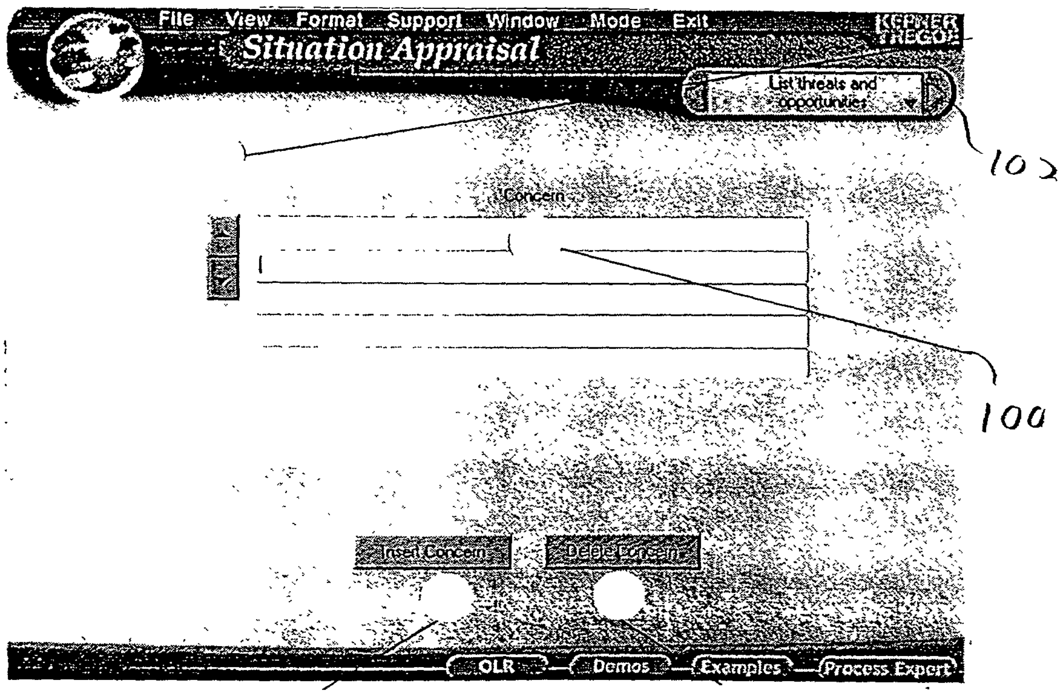

File View Format Support Window Mode Exit
KEPNER TREGOE
Situation Appraisal
List threats and opportunities
102
Concern
100
Insert Concern
Delete Concern
OLR
Demos
Examples
Process Expert

Fig. 7

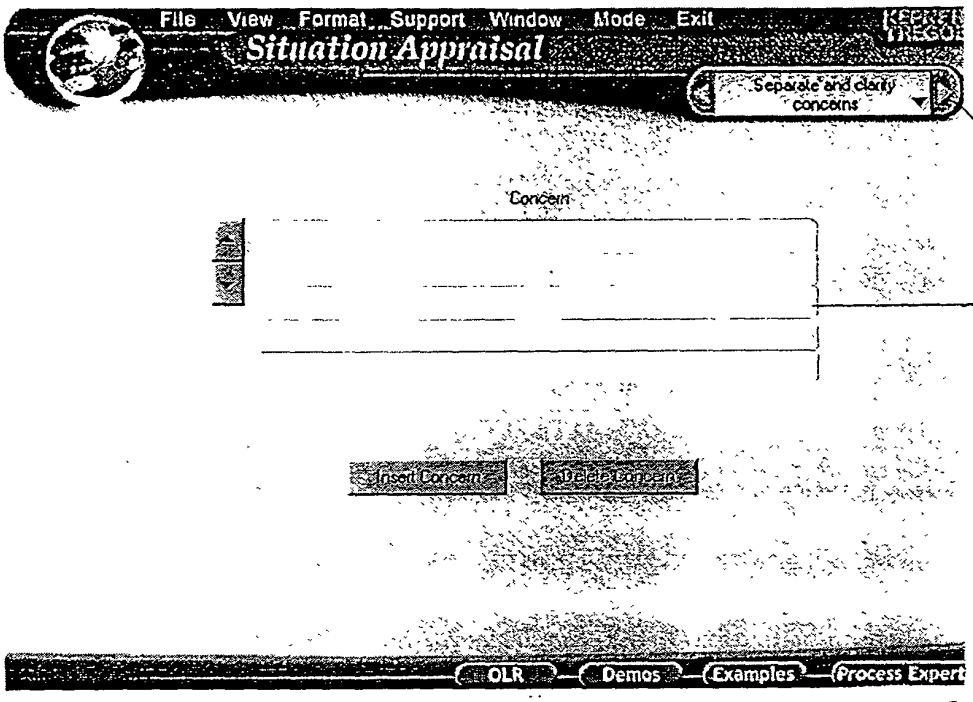


Fig. 8

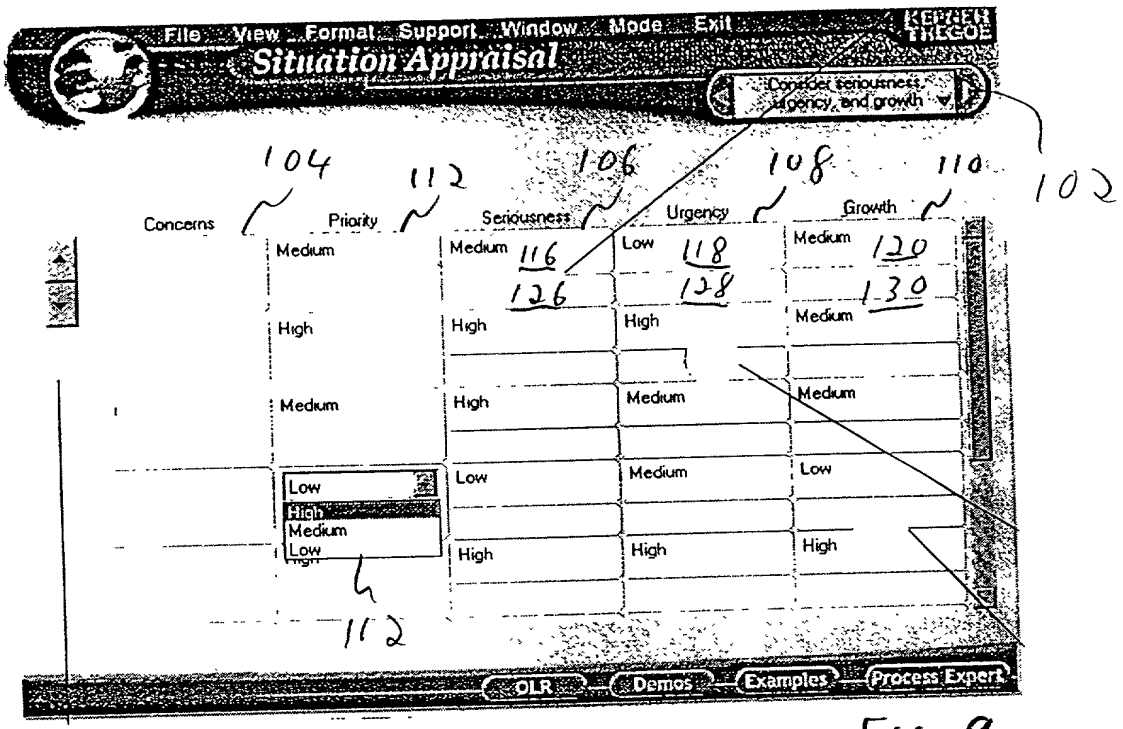

File View Format Support Window Mode Exit
Situation Appraisal
Consider seriousness, urgency, and growth
104
112
106
108
110
102
Concerns
Priority
Seriousness
Urgency
Growth
Medium
High
Medium
Low
High
Medium
Low
116
118
120
126
128
130
112
OLR
Demos
Examples
Process Expert

Fig. 9

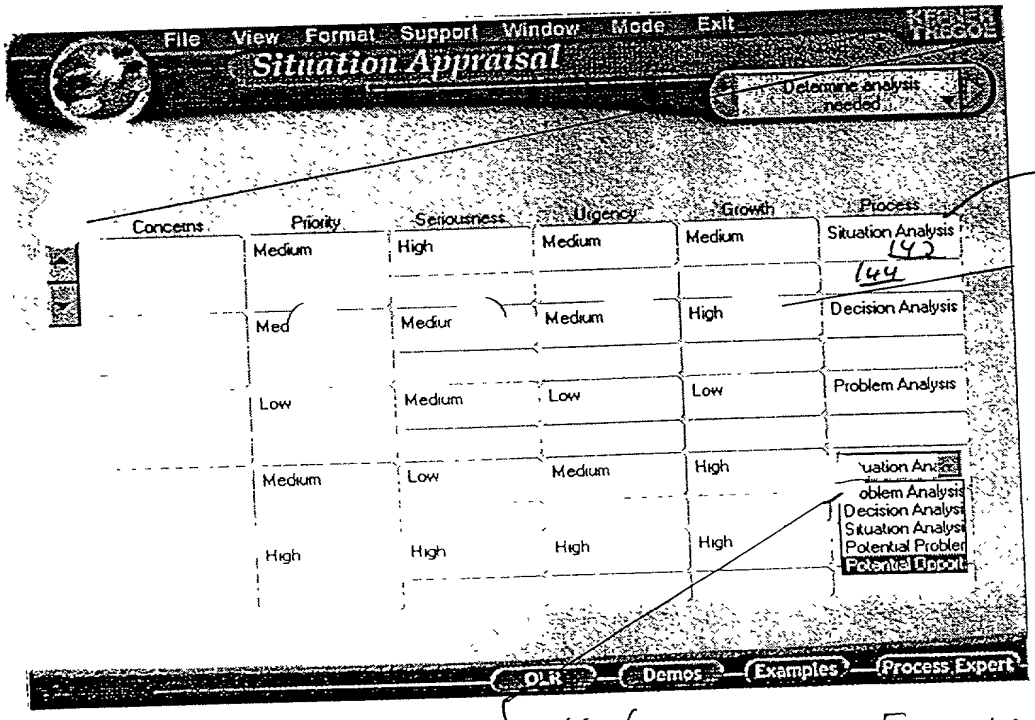

File View Format Support Window Mode Exit
Situation Appraisal
Determine analysis needed
140
Concerns
Priority
Seriousness
Urgency
Growth
Process
Situation Analysis
142
144
Decision Analysis
Problem Analysis
Medium
Low
High
OLR
Demos
Examples
Process Expert
146

Fig 10

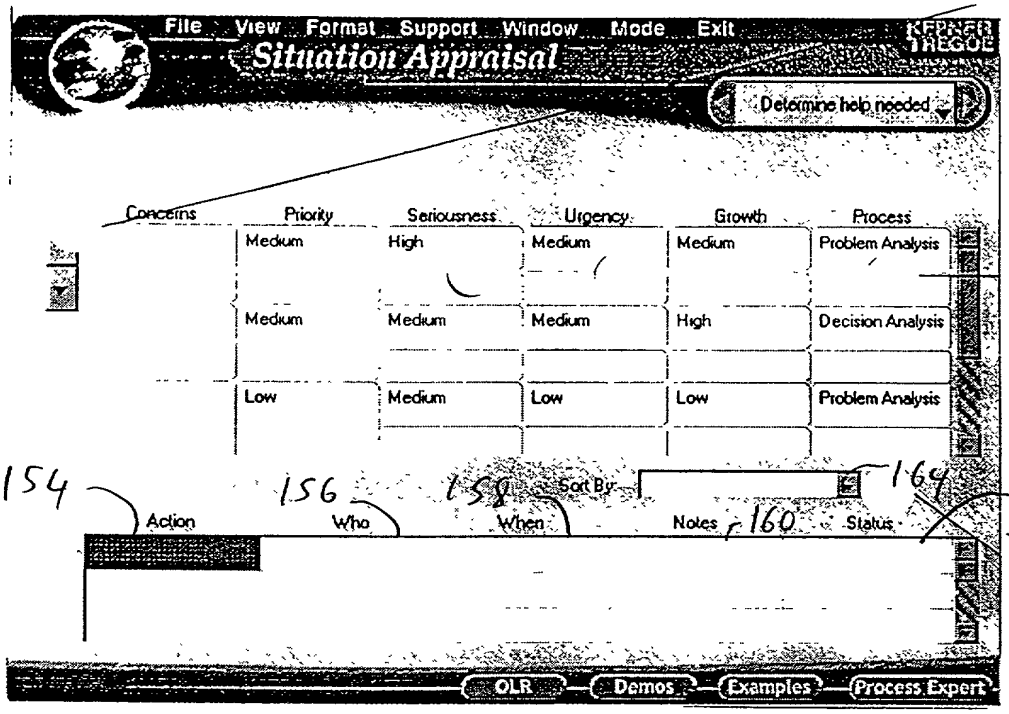

File View Format Support Window Mode Exit
Situation Appraisal
Determine help needed
Concerns
Priority
Seriousness
Urgency
Growth
Process
Medium
High
Medium
Medium
Problem Analysis
Medium
Medium
Medium
High
Decision Analysis
Low
Medium
Low
Low
Problem Analysis
150
154
156
158
Sort By
164
162
Action
Who
When
Notes
160
Status
152
OLR
Demos
Examples
Process Expert

Fig. 11

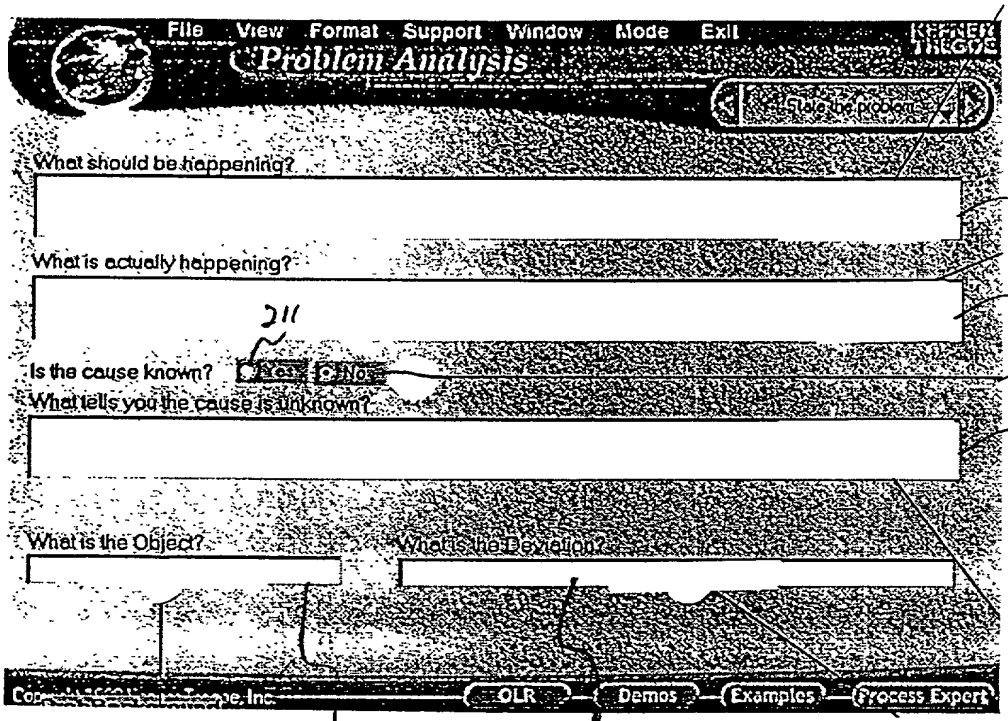

File View Format Support Window Mode Exit
Problem Analysis
What should be happening?
What is actually happening?
Is the cause known?
Yes
No
What tells you the cause is unknown?
What is the Object?
What is the Deviation?
OLR
Demos
Examples
Process Expert
200
202
210
204
206
208

Fig. 12

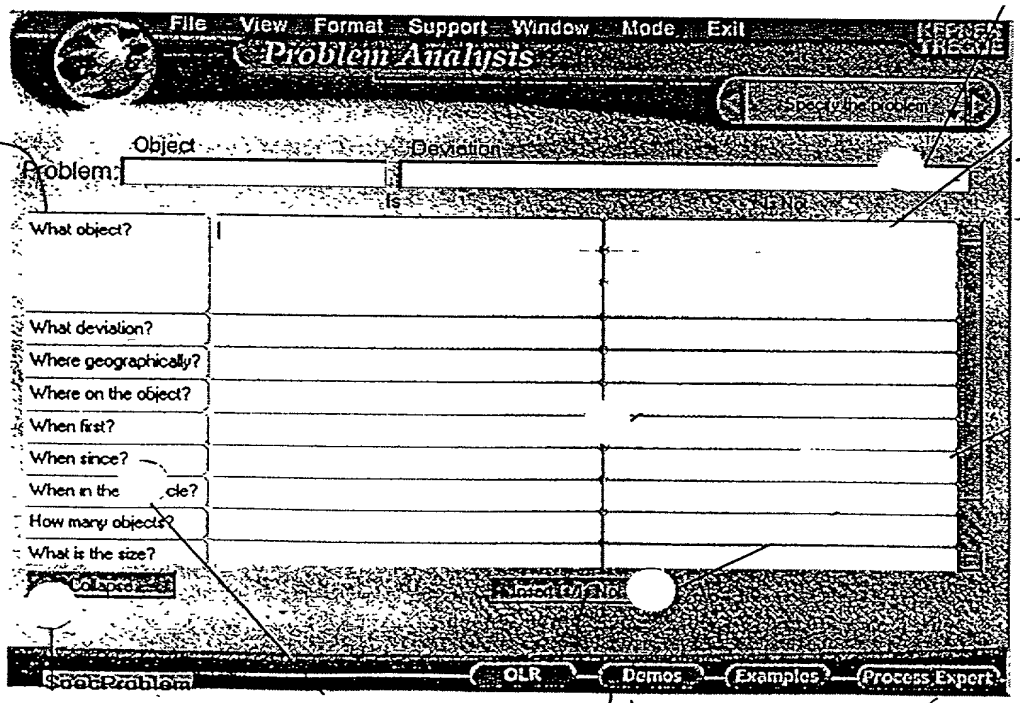

File View Format Support Window Mode Exit
Problem Analysis
Object
Deviation
Problem:
Is
Is Not
What object?
What deviation?
Where geographically?
Where on the object?
When first?
When since?
When in the cle?
How many objects?
What is the size?
Collapse All
Expand All
$setProblem
OLR
Demos
Examples
Process Expert
222
212
214
216
220
218

Fig. 13

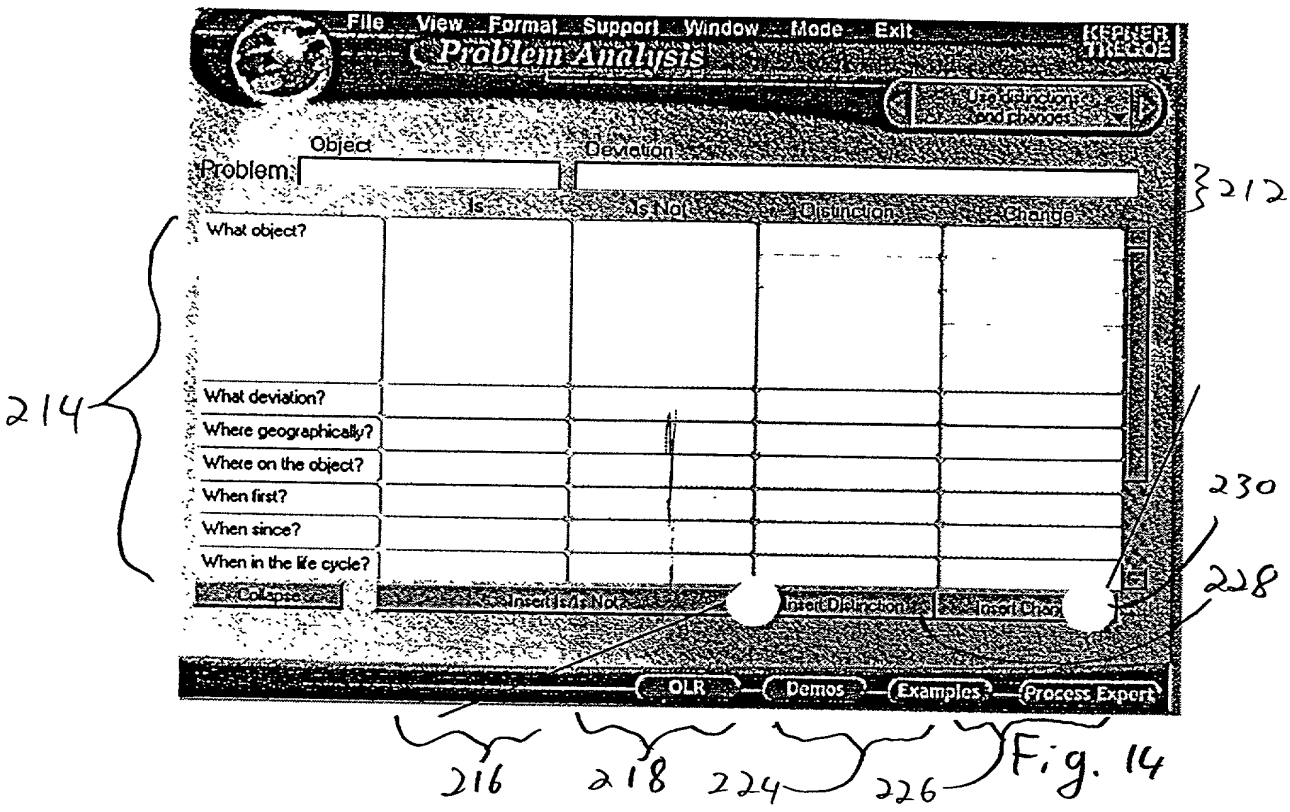

File View Format Support Window Mode Exit
Problem Analysis
KEPNER TREGOE
Object
Deviation
Problem:
Is
Is Not
Distinction
Change
What object?
What deviation?
Where geographically?
Where on the object?
When first?
When since?
When in the life cycle?
Collapse
Insert Is Not
Insert Distinction
Insert Change
OLR
Demos
Examples
Process Expert
212
214
230
228
216
218
224
226

Fig. 14

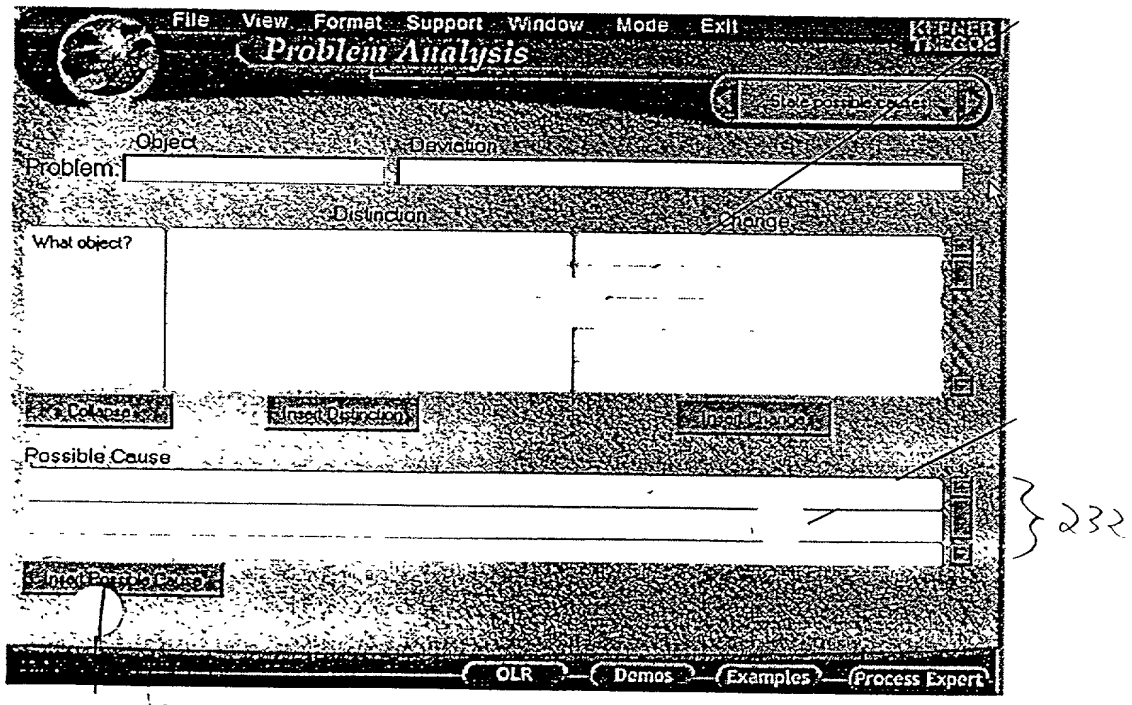

File View Format Support Window Mode Exit
Problem Analysis
KEPNER TREGOE
Object
Deviation
Problem:
Distinction
Change
What object?
Collapse
Insert Distinction
Insert Change
Possible Cause
Insert Possible Cause
OLR
Demos
Examples
Process Expert
232
234

Fig. 15

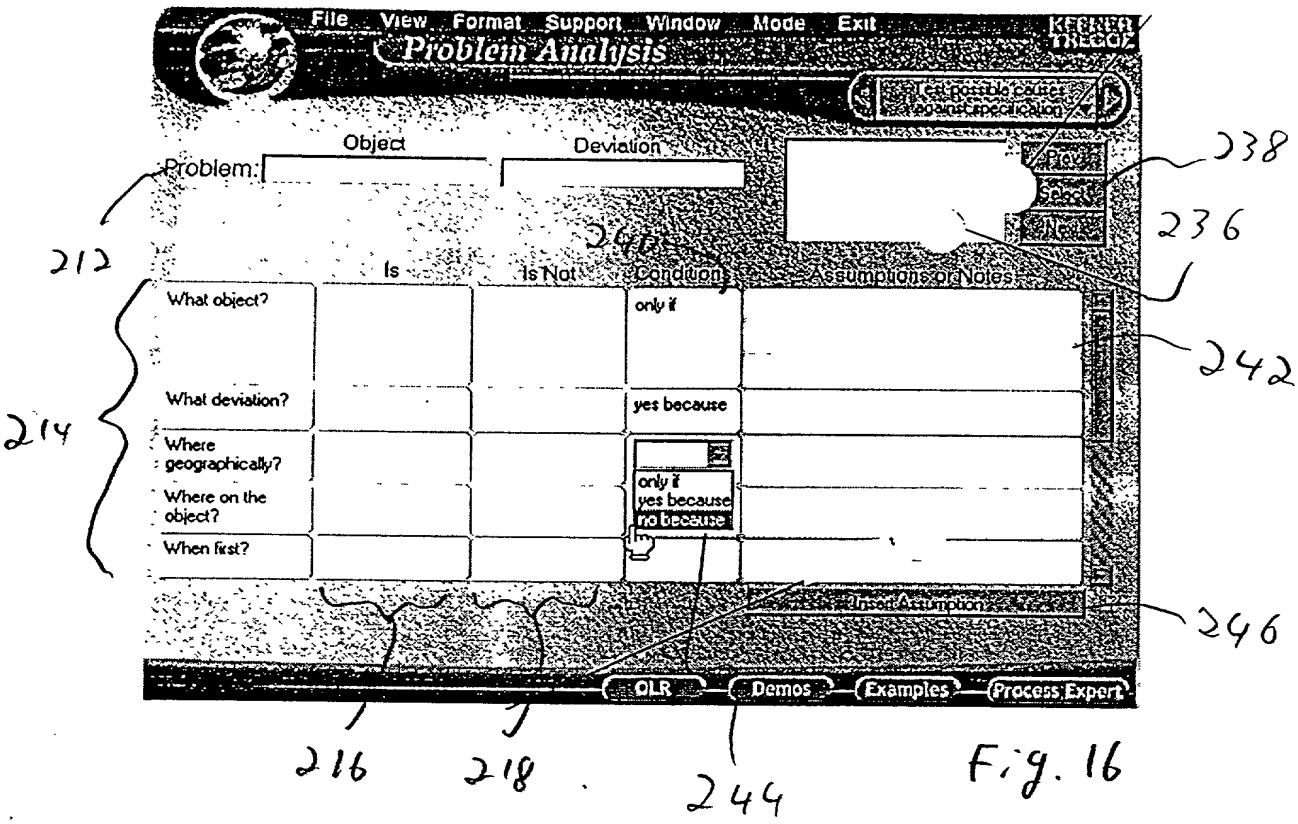

File View Format Support Window Mode Exit
Problem Analysis
KEPNER TREGOE
Test possible causes against specification
Object
Deviation
Problem:
Is
Is Not
Condition
Assumptions or Notes
What object?
What deviation?
Where geographically?
Where on the object?
When first?
only if
yes because
no because
Insert Assumption
OLR
Demos
Examples
Process Expert
212
214
216
218
238
236
240
242
244
246

Fig. 16

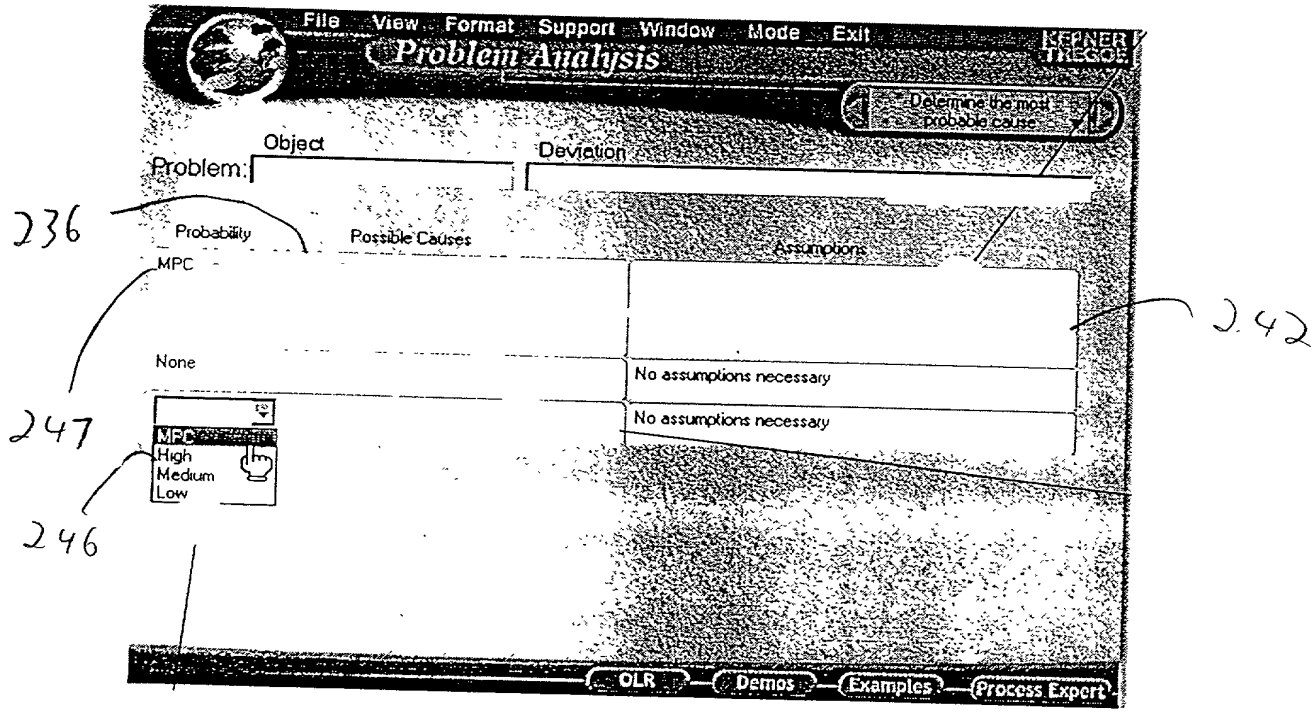

File View Format Support Window Mode Exit
Problem Analysis
KEPNER TREGOE
Determine the most probable cause
Object
Deviation
Problem:
Probability
Possible Causes
Assumptions
MPC
None
No assumptions necessary
No assumptions necessary
MPC
High
Medium
Low
OLR
Demos
Examples
Process Expert
236
242
247
246

Fig. 17

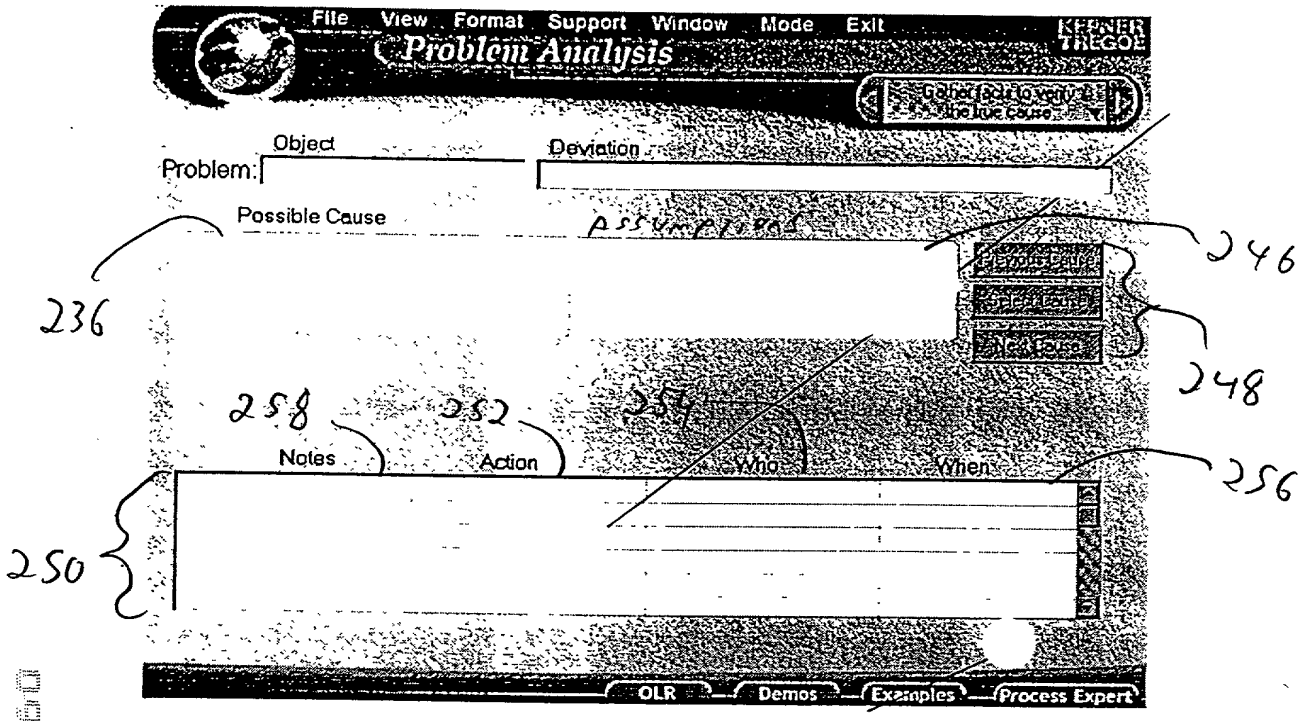

File View Format Support Window Mode Exit
KEPNER TREGOE
Problem Analysis
Object
Deviation
Problem:
Possible Cause
Assumptions
236
246
248
258
252
254
Notes
Action
Who
When
256
250
OLR
Demos
Examples
Process Expert

Fig. 18

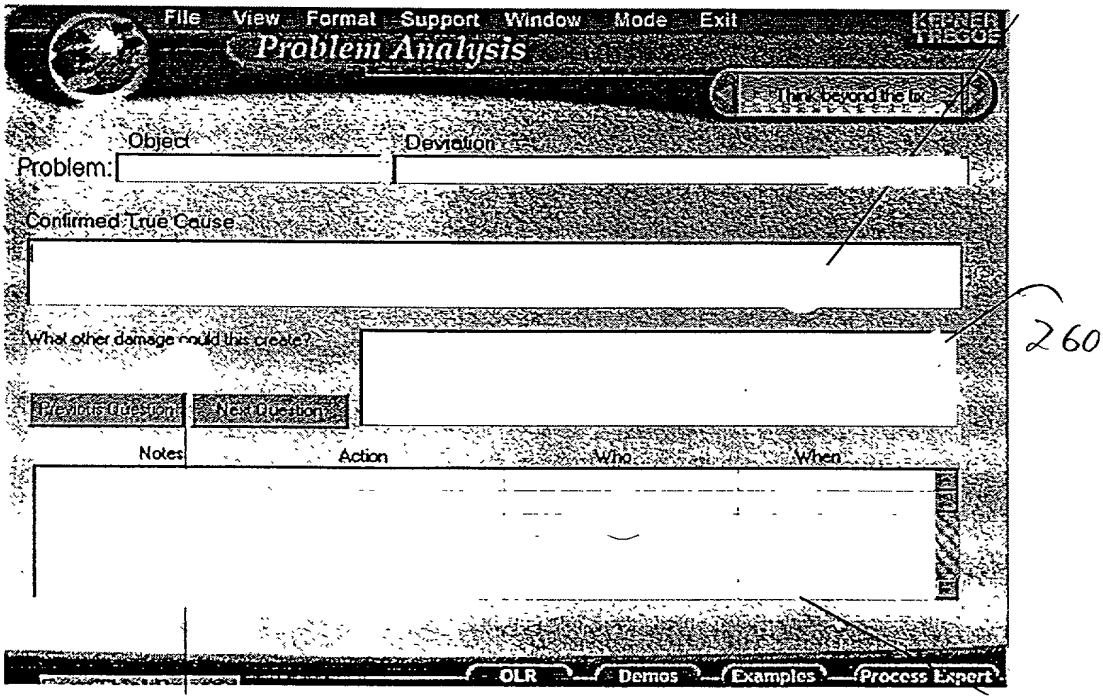

File View Format Support Window Mode Exit
KEPNER TREGOE
Problem Analysis
Object
Deviation
Problem:
Confirmed True Cause
What other damage could this create?
260
Previous Question
Next Question
Notes
Action
Who
When
OLR
Demos
Examples
Process Expert

Fig. 19

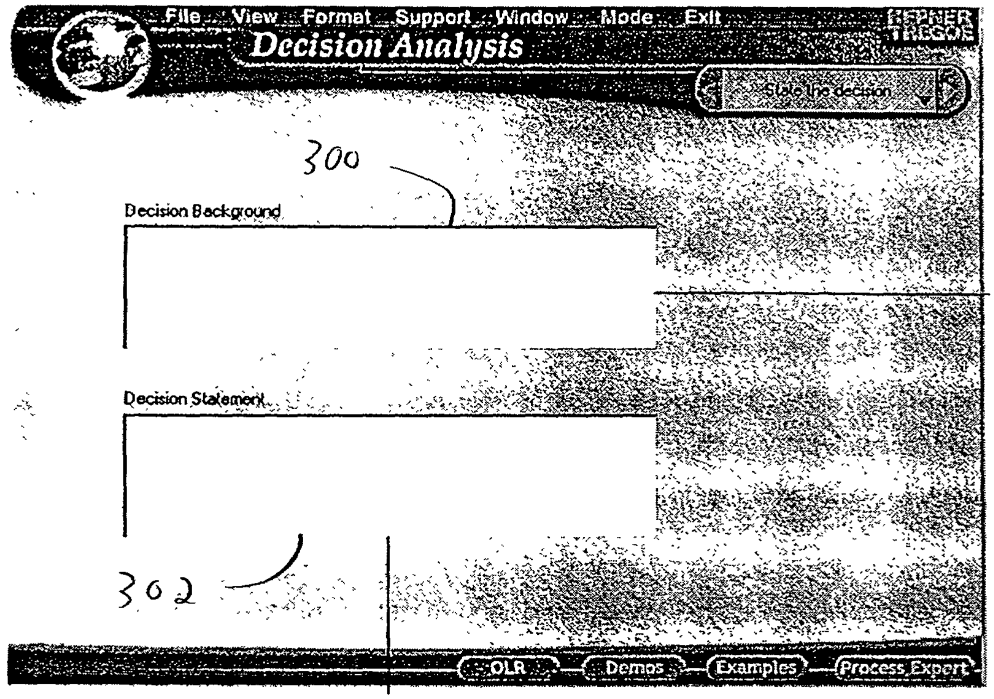


Fig. 20

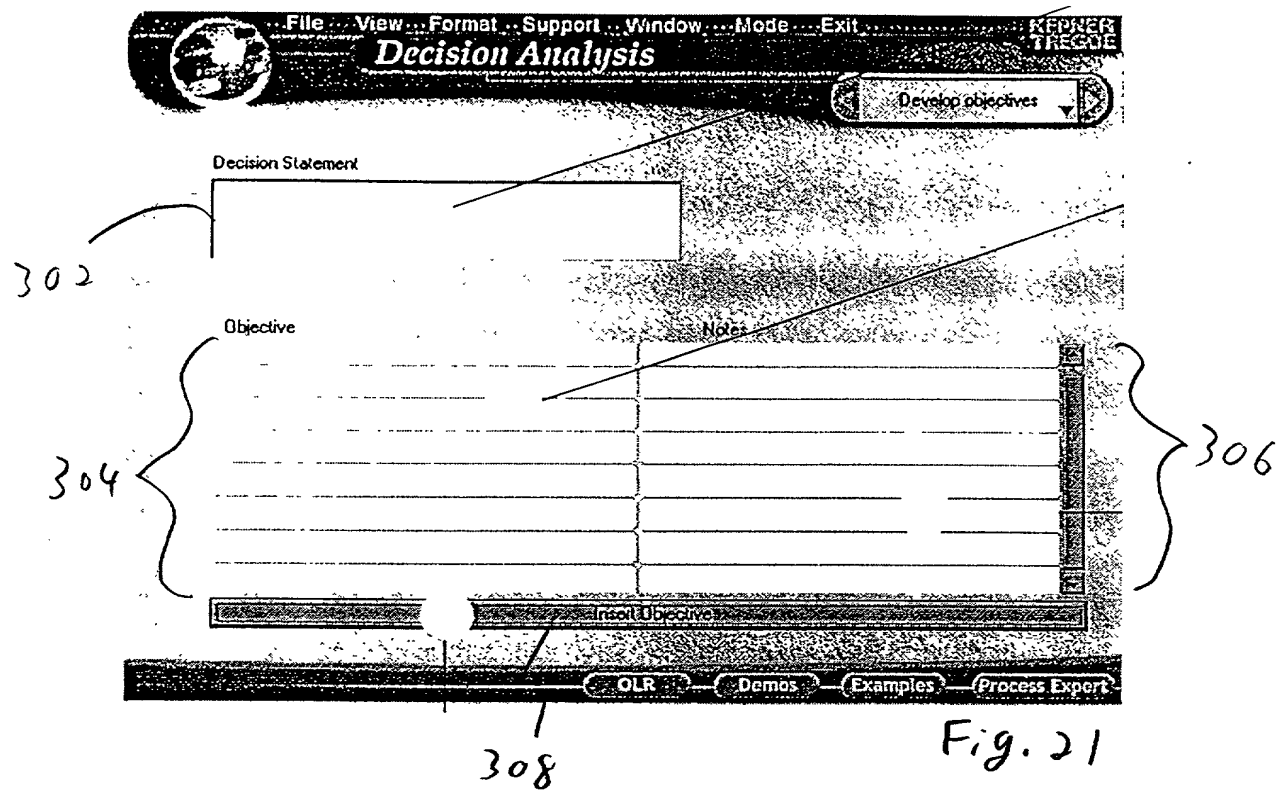

File View Format Support Window Mode Exit
Decision Analysis
KEPNER TREGOE
Develop objectives
Decision Statement
302
Objective
Notes
304
306
Insert Objective
OLR
Demos
Examples
Process Expert
308

Fig. 21

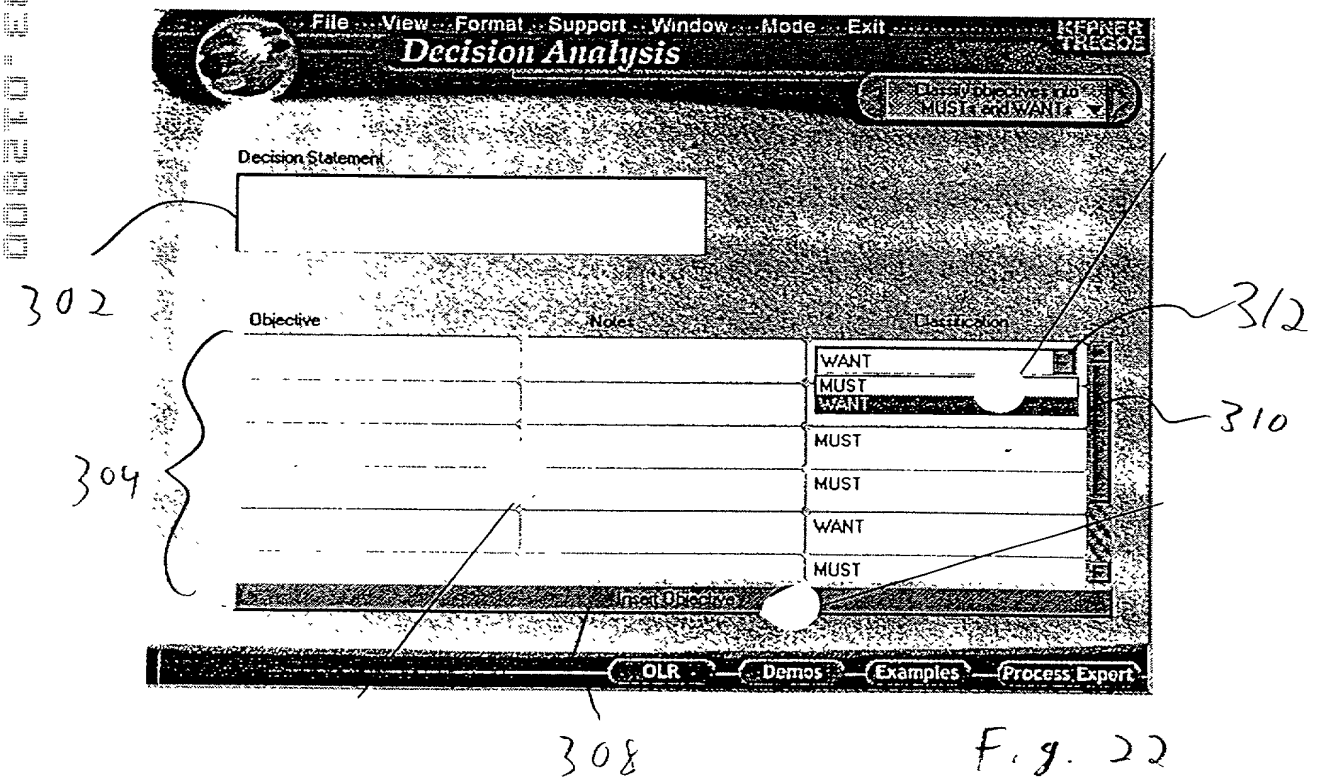

File View Format Support Window Mode Exit
Decision Analysis
KEPNER TREGOE
Decision Statement
302
Objective
Notes
Classification
312
WANT
MUST
WANT
MUST
MUST
WANT
MUST
310
304
Insert Objective
OLR
Demos
Examples
Process Expert
308

Fig. 22

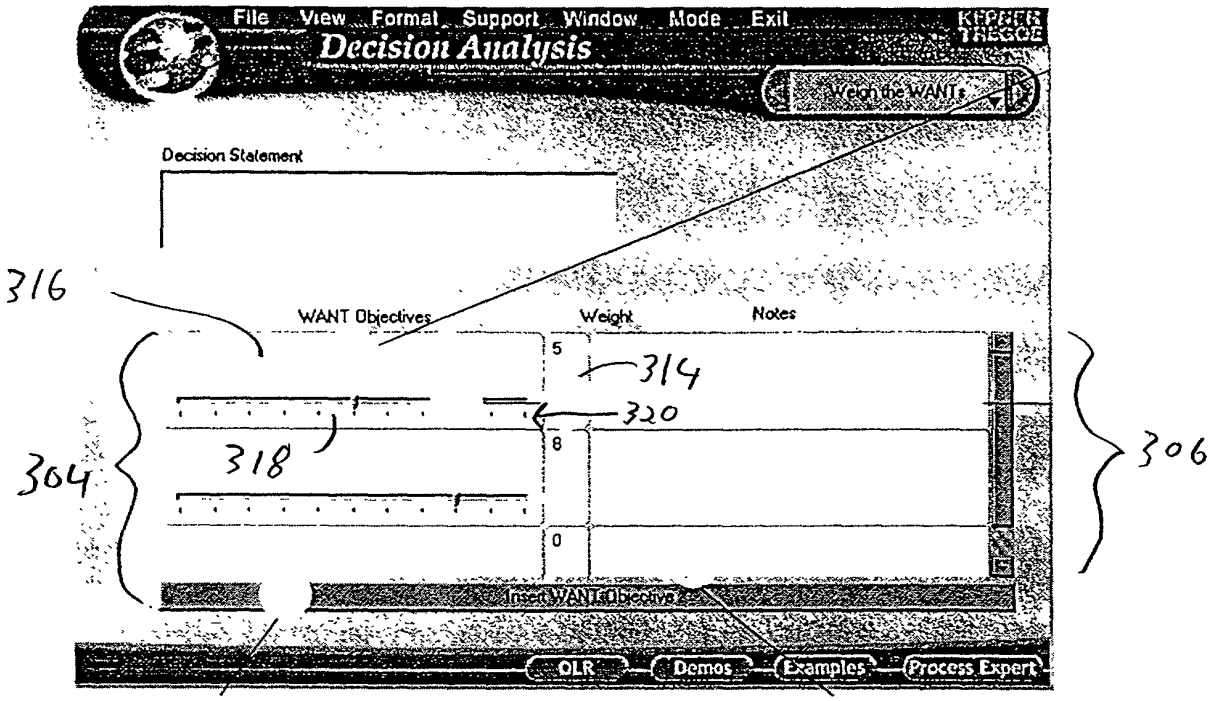

File View Format Support Window Mode Exit
Decision Analysis
Weight the WANTs
Decision Statement
316
WANT Objectives
Weight
Notes
5
314
320
8
318
304
306
0
Insert WANT Objective
OLR
Demos
Examples
Process Expert

Fig. 23

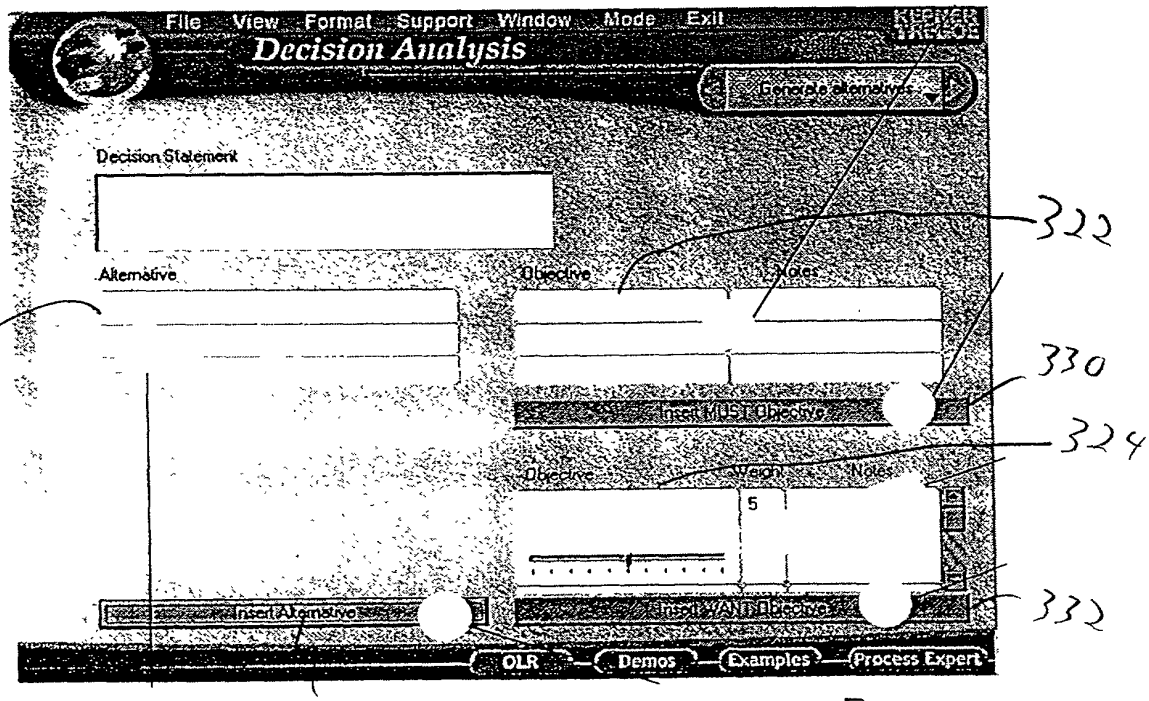

File View Format Support Window Mode Exit
Decision Analysis
Generate Alternatives
Decision Statement
322
Alternative
Objective
Notes
326
330
Insert MUST Objective
324
Objective
Weight
Notes
5
332
Insert Alternative
Insert WANT Objective
OLR
Demos
Examples
Process Expert
328

Fig. 24

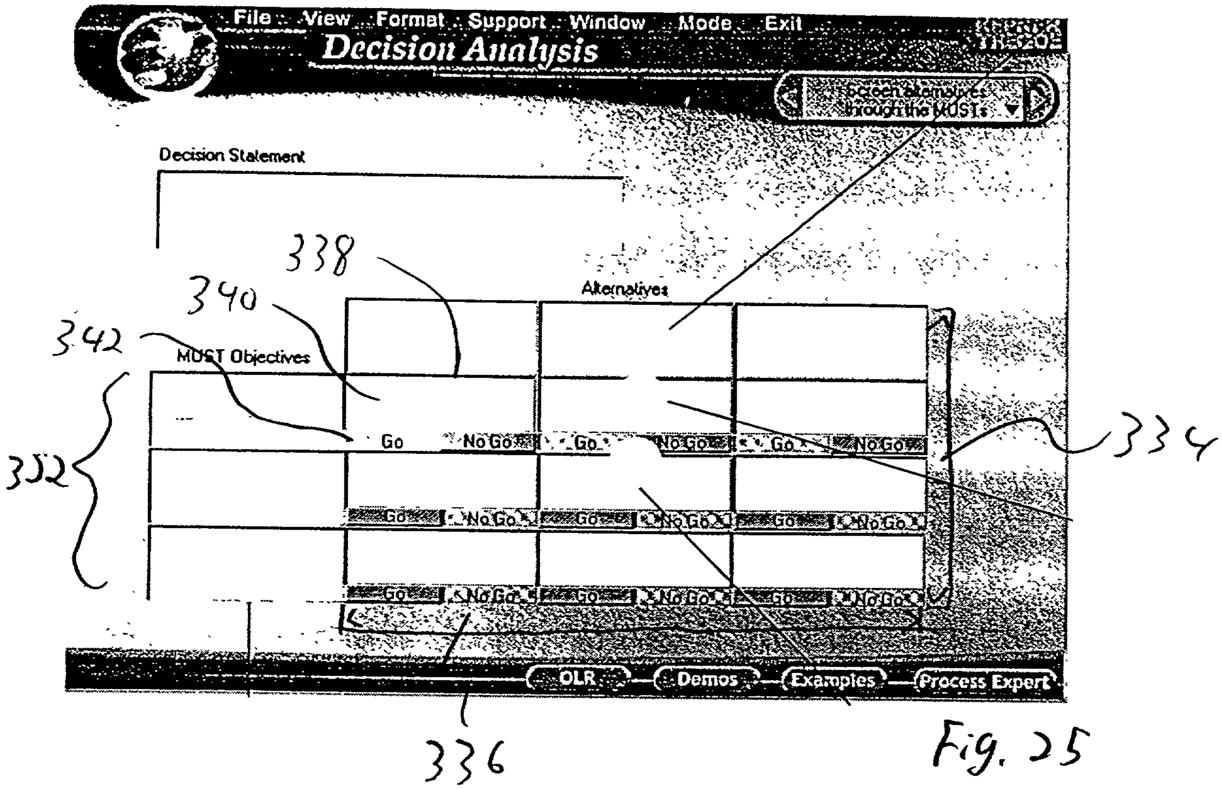


Fig. 25

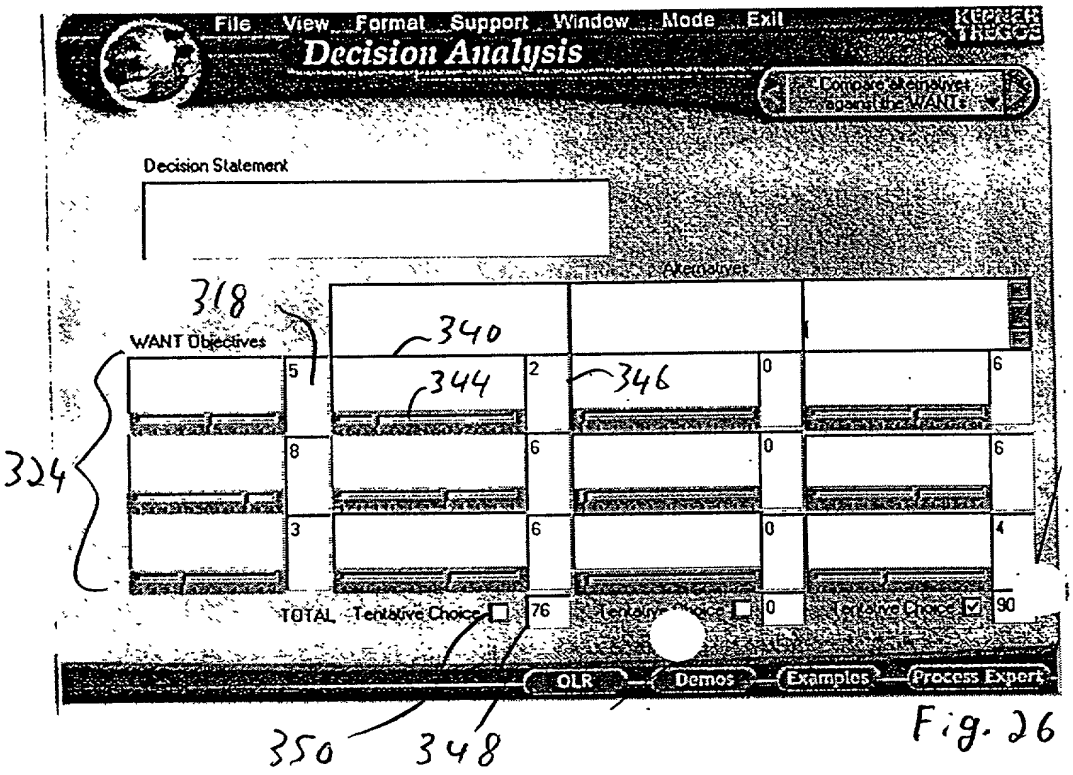

File View Format Support Window Mode Exit
KEPNER TREGOE
Decision Analysis
Decision Statement
Alternatives
WANT Objectives
318
340
344
346
324
5
2
0
6
8
6
0
6
3
6
0
4
TOTAL Tentative Choice
76
0
90
OLR
Demos
Examples
Process Expert
350
348

Fig. 26

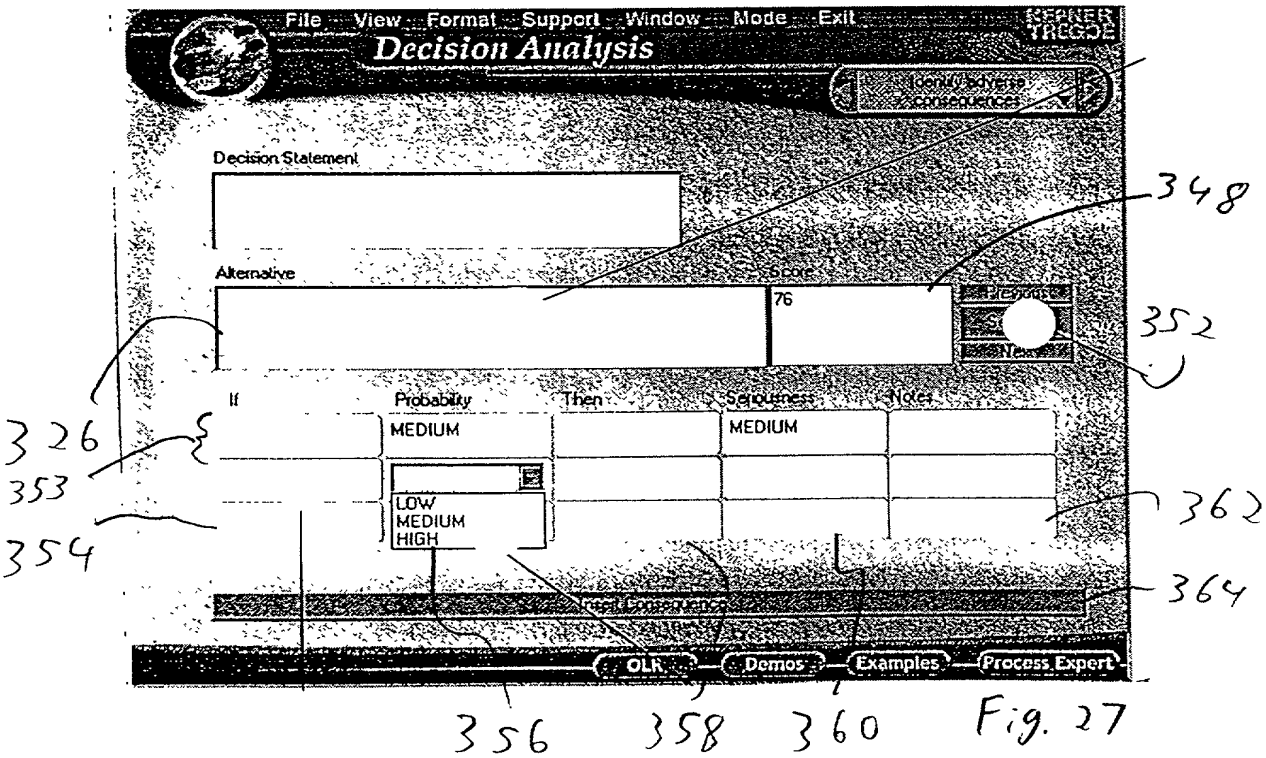

File View Format Support Window Mode Exit
KEPNER TREGOE
Decision Analysis
Decision Statement
348
Alternative
76
352
If
Probability
Then
Seriousness
Note
326
MEDIUM
MEDIUM
353
LOW
MEDIUM
HIGH
362
354
364
OLR
Demos
Examples
Process Expert
356
358
360

Fig. 27

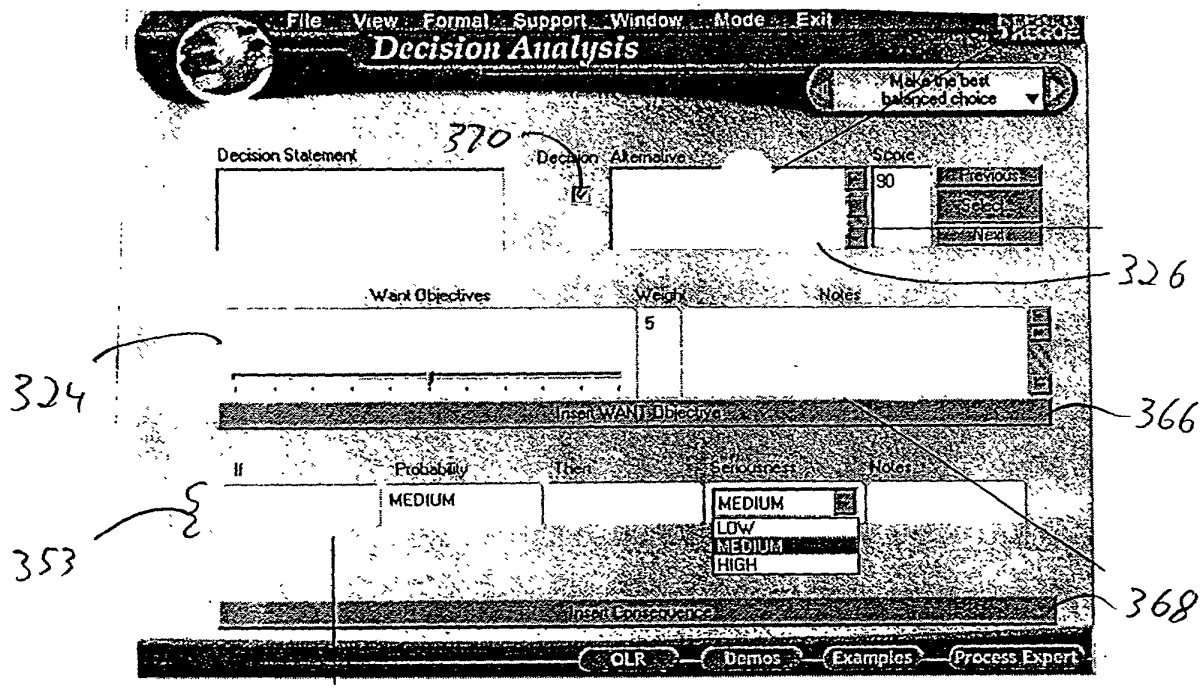

File View Format Support Window Mode Exit
Decision Analysis
Make the best balanced choice
Decision Statement
370
Decision Alternative
Score
30
Previous
Select
Next
326
Want Objectives
Weight
Notes
5
324
Insert WANT Objective
366
If
Probability
Then
Consequence
Notes
MEDIUM
MEDIUM
LOW
MEDIUM
HIGH
353
Insert Consequence
368
OLR
Demos
Examples
Process Expert

Fig. 28

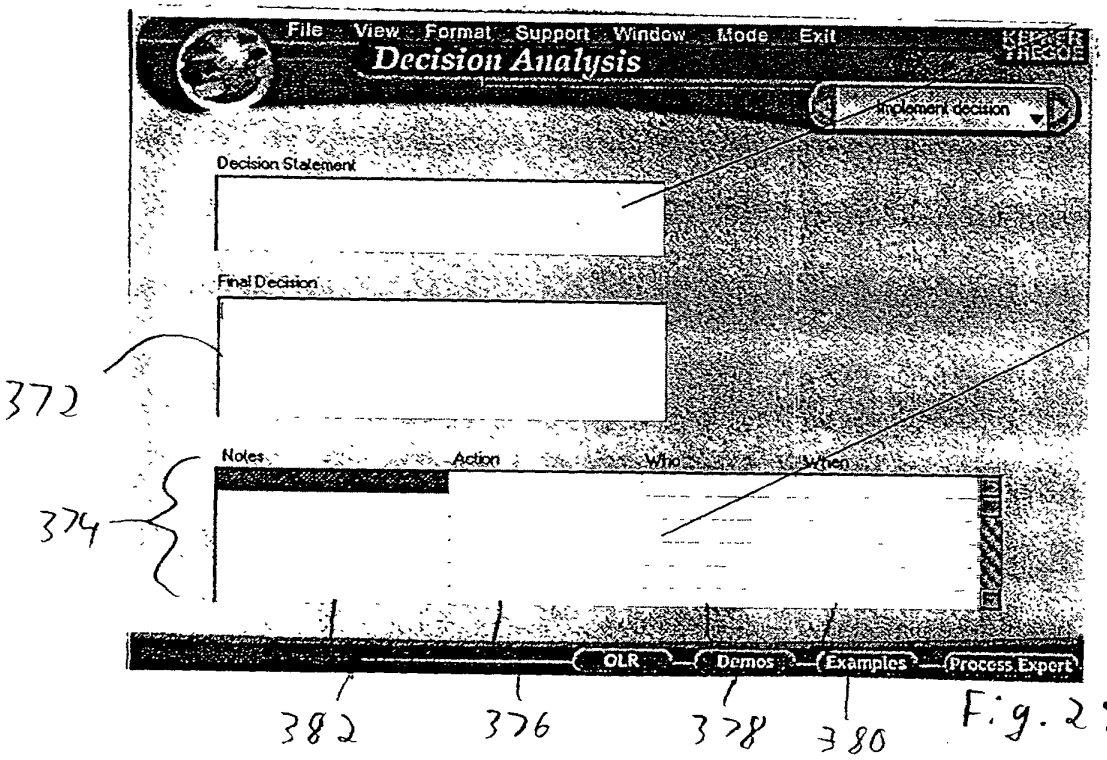
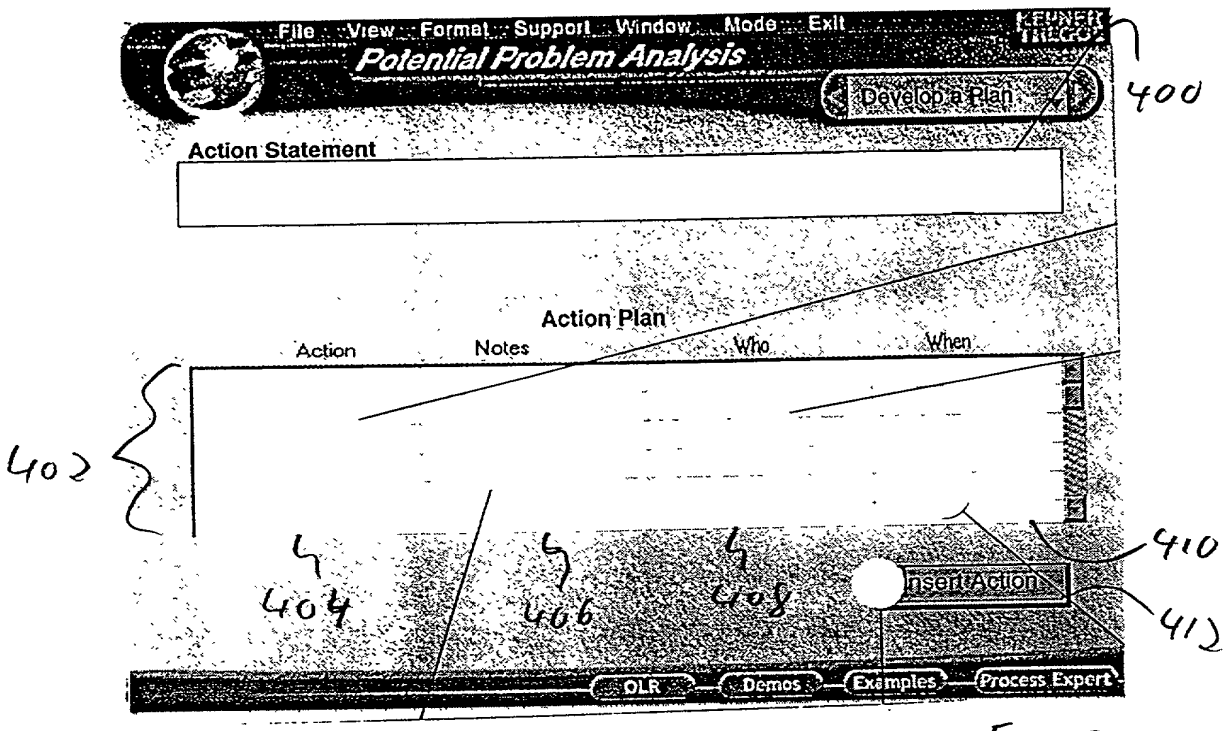
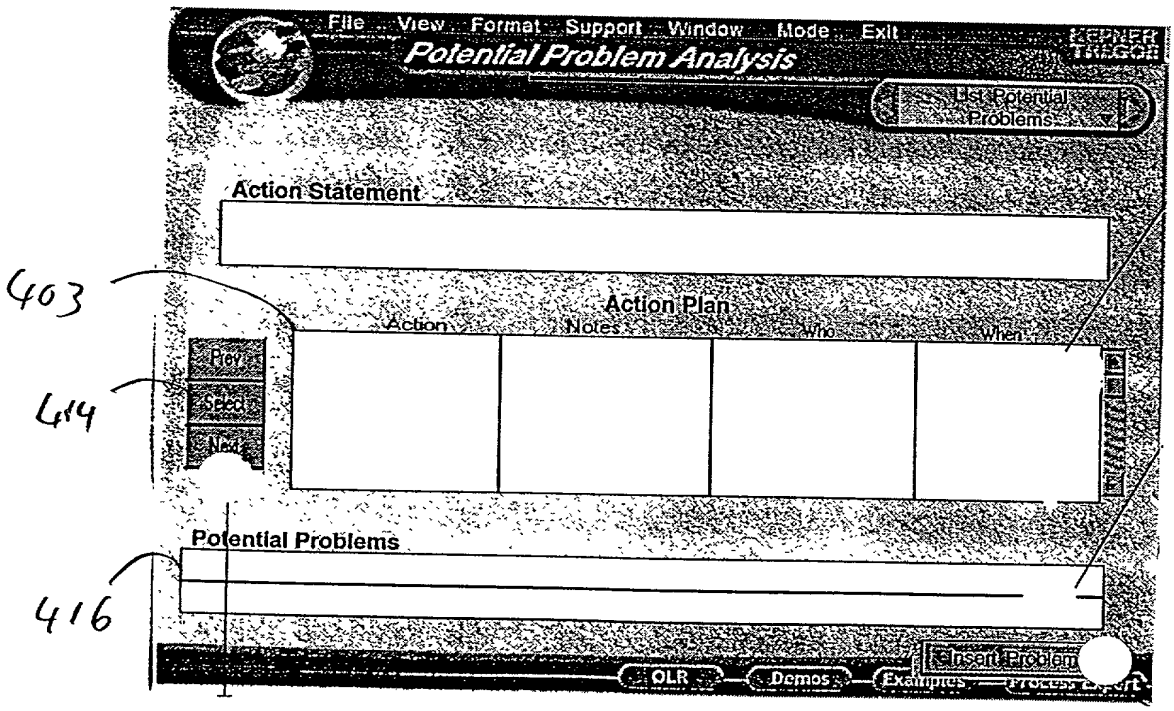

File View Format Support Window Mode Exit
Decision Analysis
Implement decision
Decision Statement
Final Decision
372
Notes
Action
Who
When
374
OLR
Demos
Examples
Process Expert
382
376
378
380

Fig. 29


File View Format Support Window Mode Exit
KEPNER TREGOE
Potential Problem Analysis
Develop a Plan
400
Action Statement
Action Plan
Action
Notes
Who
When
402
404
406
408
410
Insert Action
412
OLR
Demos
Examples
Process Expert

F:g. 30


File View Format Support Window Mode Exit
KEPNER TREGOE
Potential Problem Analysis
List Potential Problems
Action Statement
403
Action Plan
Action
Notes
Who
When
414
Prev
Next
Potential Problems
416
Insert Problem
OLR
Demos
Examples

F:g. 31

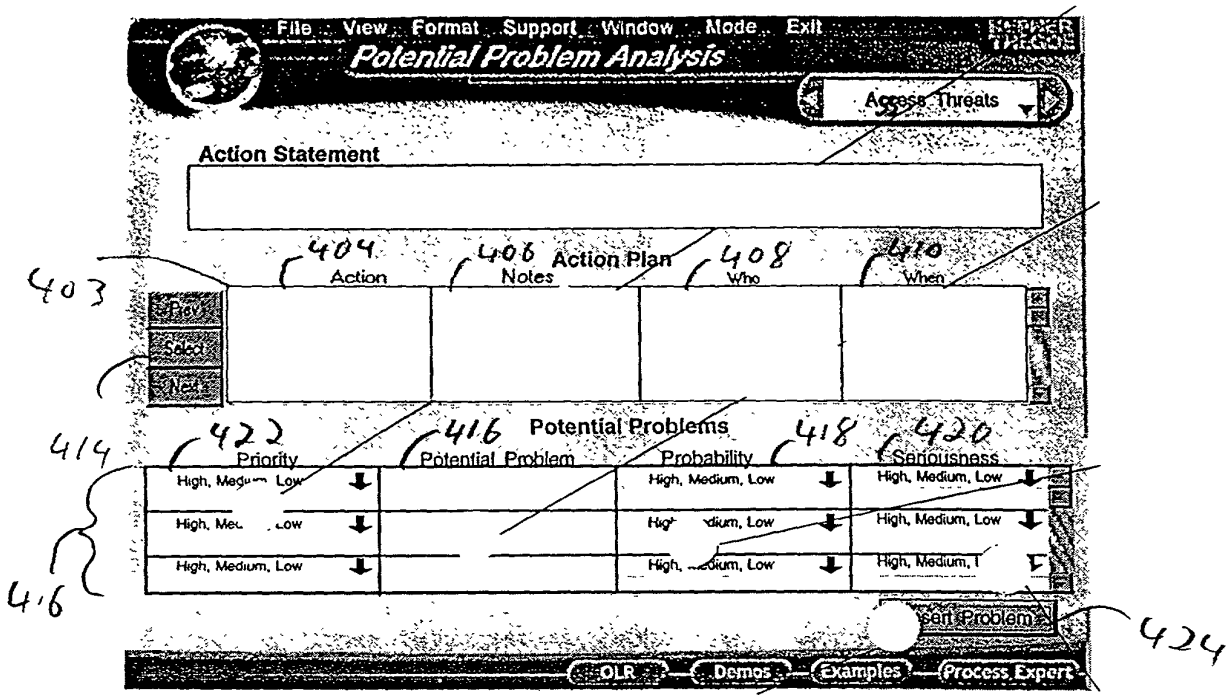

File View Format Support Window Mode Exit
Potential Problem Analysis
Access Threats
Action Statement
403
404
Action
406
Notes
Action Plan
408
Who
410
When
Prev
Select
Next
414
422
Priority
416
Potential Problem
Potential Problems
418
Probability
420
Seriousness
High, Medium, Low
Insert Problem
424
OLR
Demos
Examples
Process Expert

Fig. 32

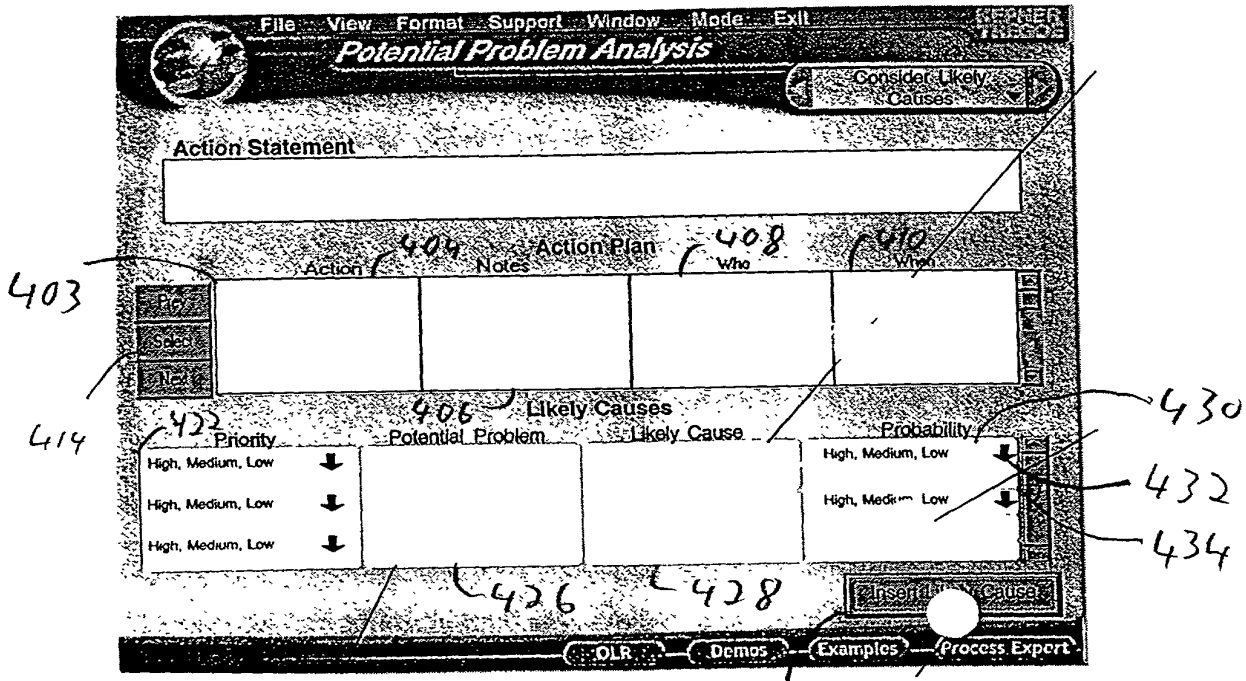

File View Format Support Window Mode Exit
Potential Problem Analysis
Consider Likely Causes
Action Statement
403
404
Action
Notes
Action Plan
408
Who
410
When
414
422
Priority
406
Likely Causes
Potential Problem
Likely Cause
430
Probability
High, Medium, Low
432
434
426
428
Insert Cause
436
OLR
Demos
Examples
Process Expert

Fig. 33

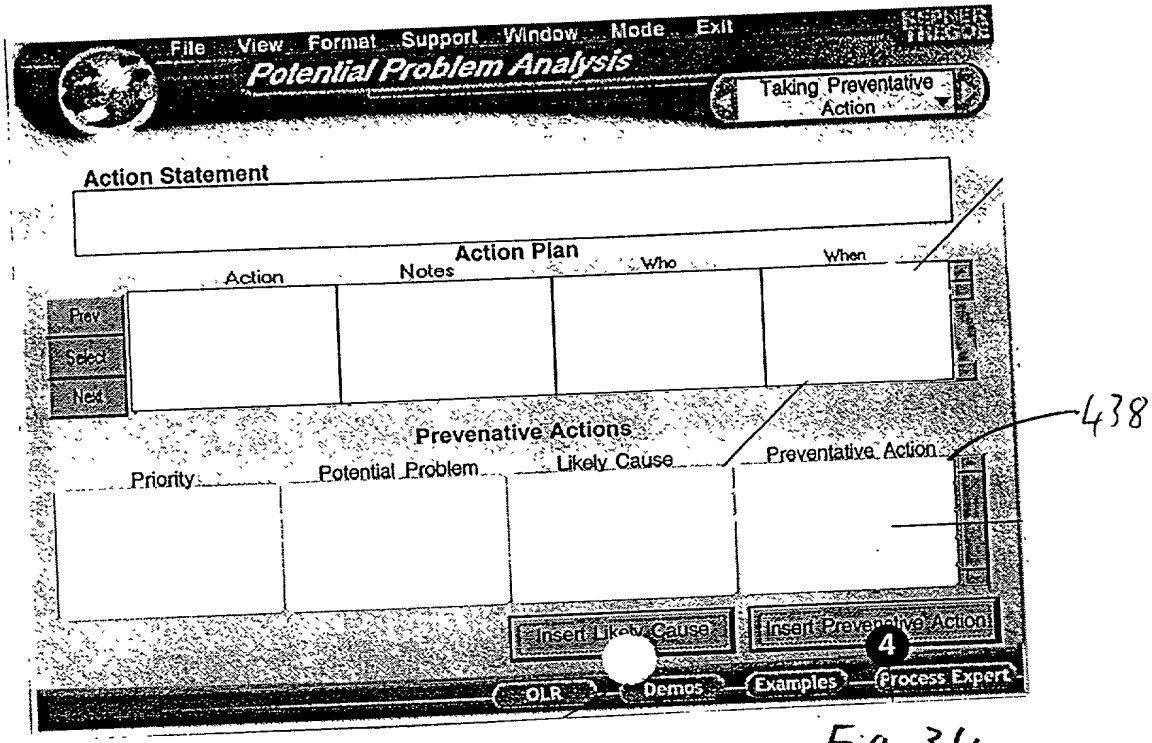

File View Format Support Window Mode Exit
Potential Problem Analysis
Taking Preventative Action
Action Statement
Action Plan
Action
Notes
Who
When
Prev
Select
Next
Prevenative Actions
Priority
Potential Problem
Likely Cause
Preventative Action
438
Insert Likely Cause
Insert Preventative Action
4
OLR
Demos
Examples
Process Expert

Fig. 34

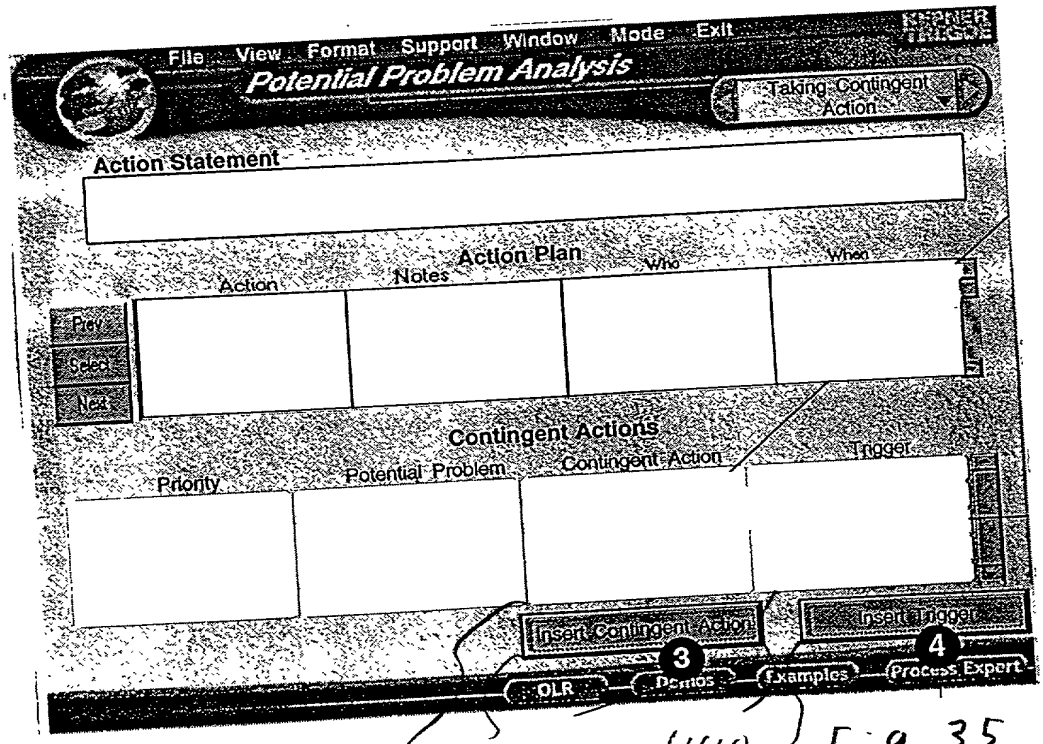

File View Format Support Window Mode Exit
Potential Problem Analysis
Taking Contingent Action
Action Statement
Action Plan
Action
Notes
Who
When
Prev
Select
Next
Contingent Actions
Priority
Potential Problem
Contingent Action
Trigger
Insert Contingent Action
Insert Trigger
3
4
OLR
Demos
Examples
Process Expert
439
442
440
444

Fig. 35

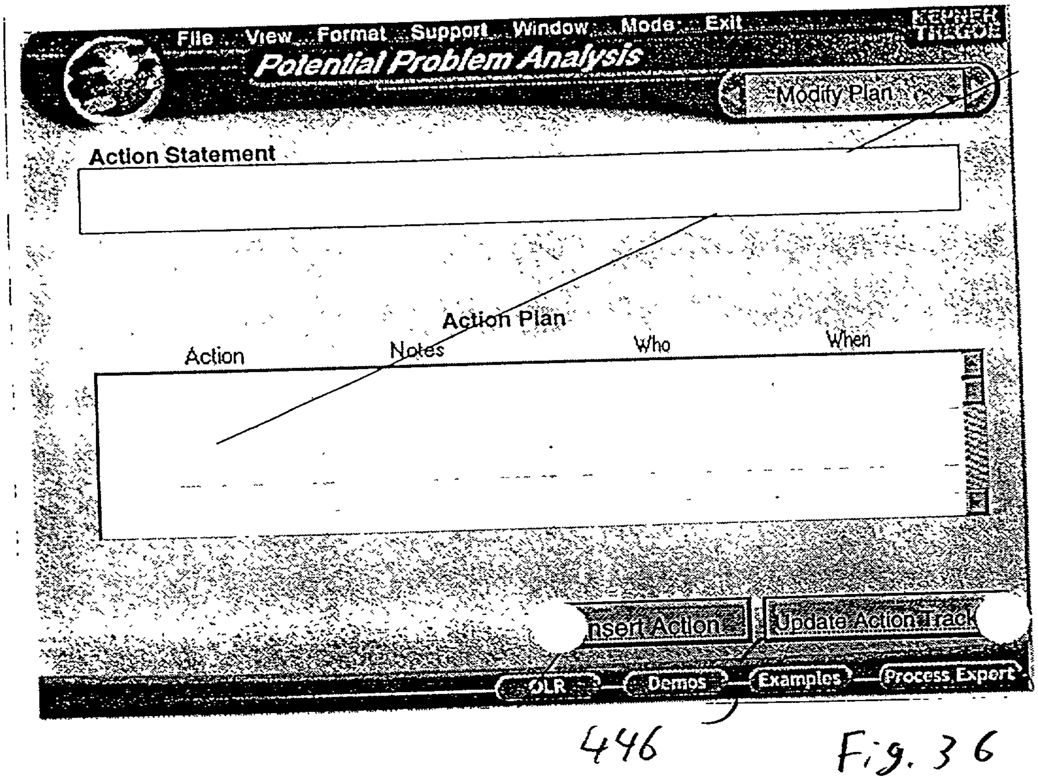


Fig. 36

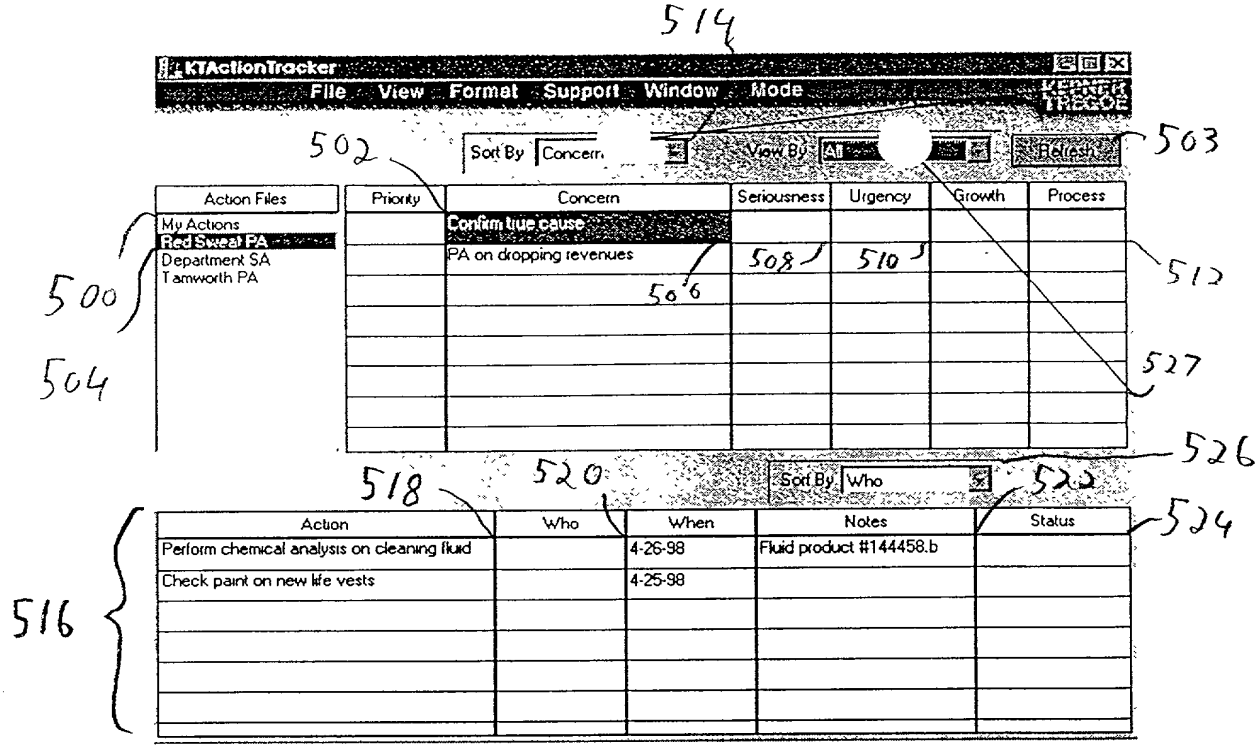

514
KTActionTracker
File View Format Support Window Mode
Sort By Concern
View By All
Refresh
502
503
Action Files
My Actions
Red Sweat PA
Department SA
Tamworth PA
500
504
Priority
Concern
Confirm true cause
PA on dropping revenues
506
Seriousness
Urgency
Growth
Process
508
510
512
527
526
518
520
Sort By Who
522
524
516
Action
Who
When
Notes
Status
Perform chemical analysis on cleaning fluid
4-26-98
Fluid product #144458.b
Check paint on new life vests
4-25-98

Fig. 37

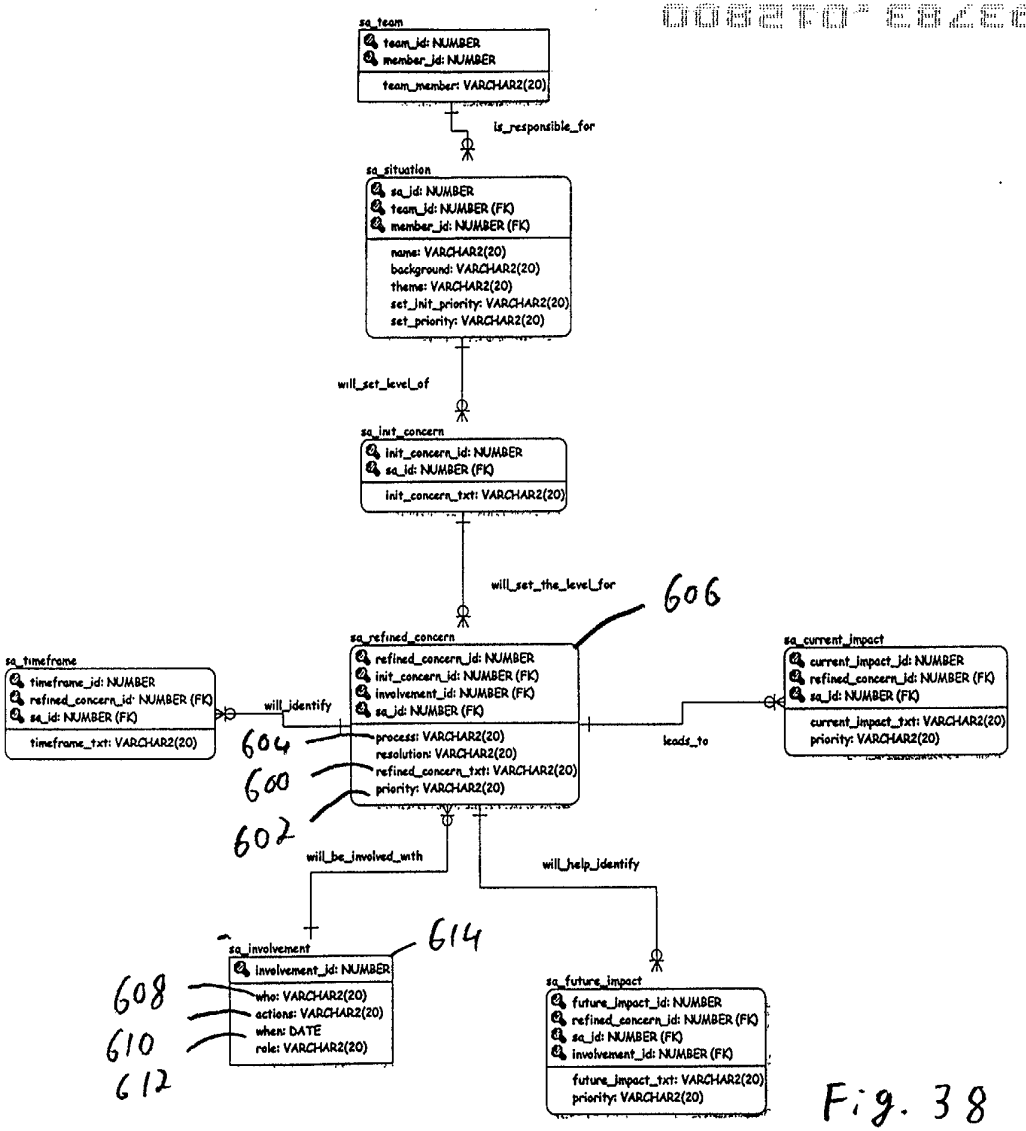

sq_team
team_id: NUMBER
member_id: NUMBER
team_member: VARCHAR2(20)
is_responsible_for
sq_situation
sq_id: NUMBER
team_id: NUMBER (FK)
member_id: NUMBER (FK)
name: VARCHAR2(20)
background: VARCHAR2(20)
theme: VARCHAR2(20)
set_init_priority: VARCHAR2(20)
set_priority: VARCHAR2(20)
will_set_level_of
sq_init_concern
init_concern_id: NUMBER
sq_id: NUMBER (FK)
init_concern_txt: VARCHAR2(20)
will_set_the_level_for
606
sq_refined_concern
refined_concern_id: NUMBER
init_concern_id: NUMBER (FK)
involvement_id: NUMBER (FK)
sq_id: NUMBER (FK)
process: VARCHAR2(20)
resolution: VARCHAR2(20)
refined_concern_txt: VARCHAR2(20)
priority: VARCHAR2(20)
sq_timeframe
timeframe_id: NUMBER
refined_concern_id: NUMBER (FK)
sq_id: NUMBER (FK)
timeframe_txt: VARCHAR2(20)
will_identify
604
600
602
leads_to
sq_current_impact
current_impact_id: NUMBER
refined_concern_id: NUMBER (FK)
sq_id: NUMBER (FK)
current_impact_txt: VARCHAR2(20)
priority: VARCHAR2(20)
will_be_involved_wth
will_help_identify
614
sq_involvement
involvement_id: NUMBER
608
who: VARCHAR2(20)
610
actions: VARCHAR2(20)
when: DATE
612
role: VARCHAR2(20)
sq_future_impact
future_impact_id: NUMBER
refined_concern_id: NUMBER (FK)
sq_id: NUMBER (FK)
involvement_id: NUMBER (FK)
future_impact_txt: VARCHAR2(20)
priority: VARCHAR2(20)

Fig. 38

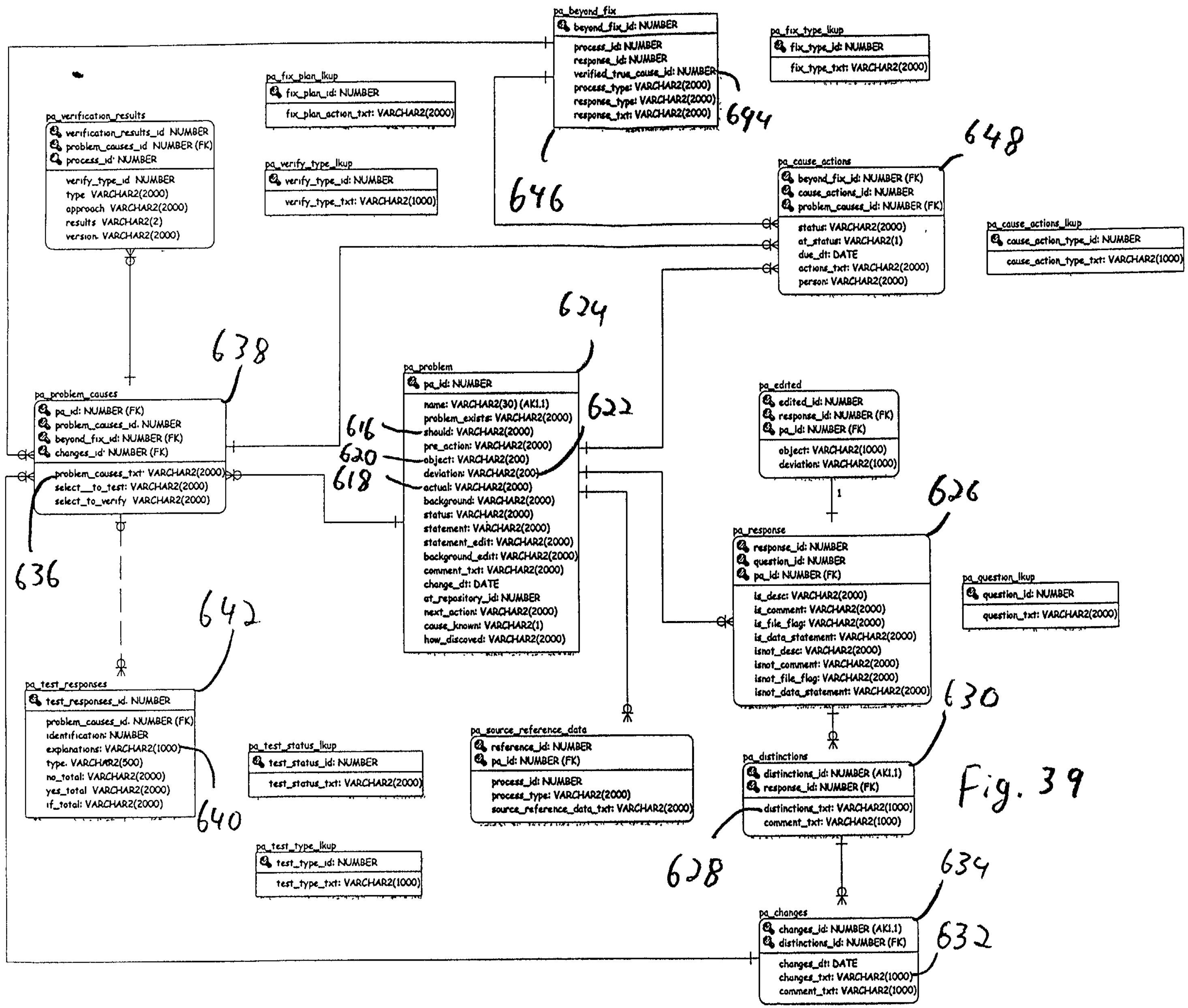


Fig. 39

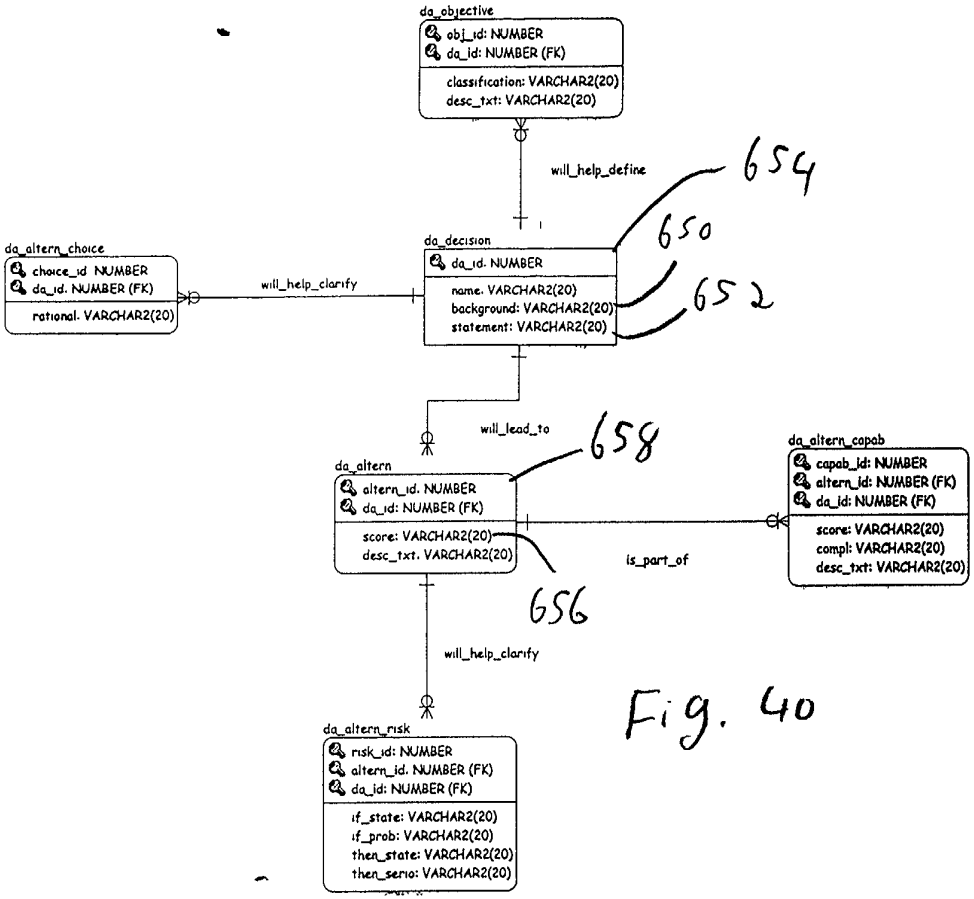


Fig. 40

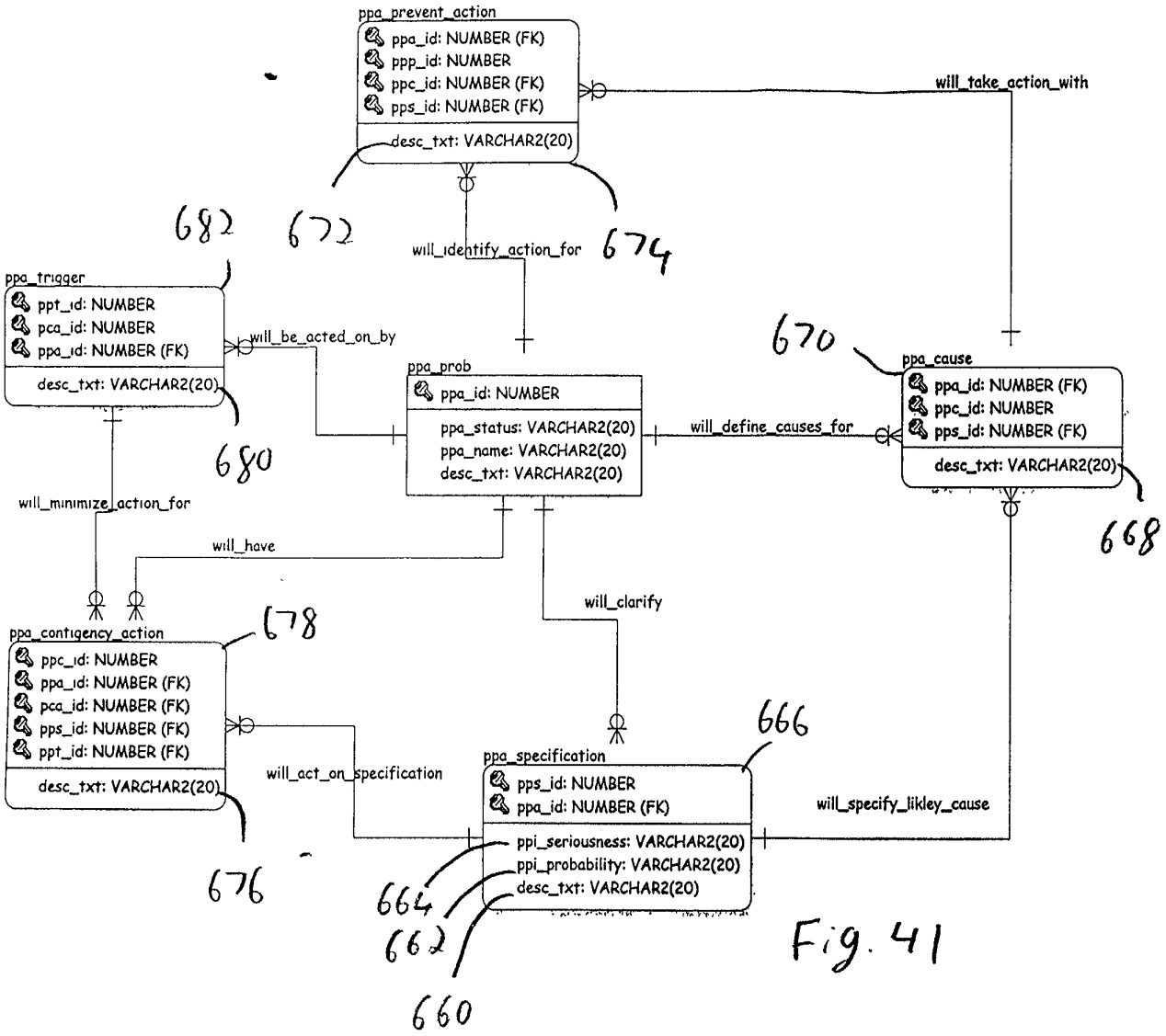

ppa_prevent_action
ppa_id: NUMBER (FK)
ppp_id: NUMBER
ppc_id: NUMBER (FK)
pps_id: NUMBER (FK)
desc_txt: VARCHAR2(20)
will_take_action_with
will_identify_action_for
682
672
674
ppa_trigger
ppt_id: NUMBER
pca_id: NUMBER
ppa_id: NUMBER (FK)
desc_txt: VARCHAR2(20)
will_be_acted_on_by
680
ppa_prob
ppa_id: NUMBER
ppa_status: VARCHAR2(20)
ppa_name: VARCHAR2(20)
desc_txt: VARCHAR2(20)
will_define_causes_for
670
ppa_cause
ppa_id: NUMBER (FK)
ppc_id: NUMBER
pps_id: NUMBER (FK)
desc_txt: VARCHAR2(20)
668
will_minimize_action_for
will_have
will_clarify
678
ppa_contigency_action
ppc_id: NUMBER
ppa_id: NUMBER (FK)
pca_id: NUMBER (FK)
pps_id: NUMBER (FK)
ppt_id: NUMBER (FK)
desc_txt: VARCHAR2(20)
676
will_act_on_specification
666
ppa_specification
pps_id: NUMBER
ppa_id: NUMBER (FK)
ppi_seriousness: VARCHAR2(20)
ppi_probability: VARCHAR2(20)
desc_txt: VARCHAR2(20)
will_specify_likley_cause
664
662
660

Fig. 41

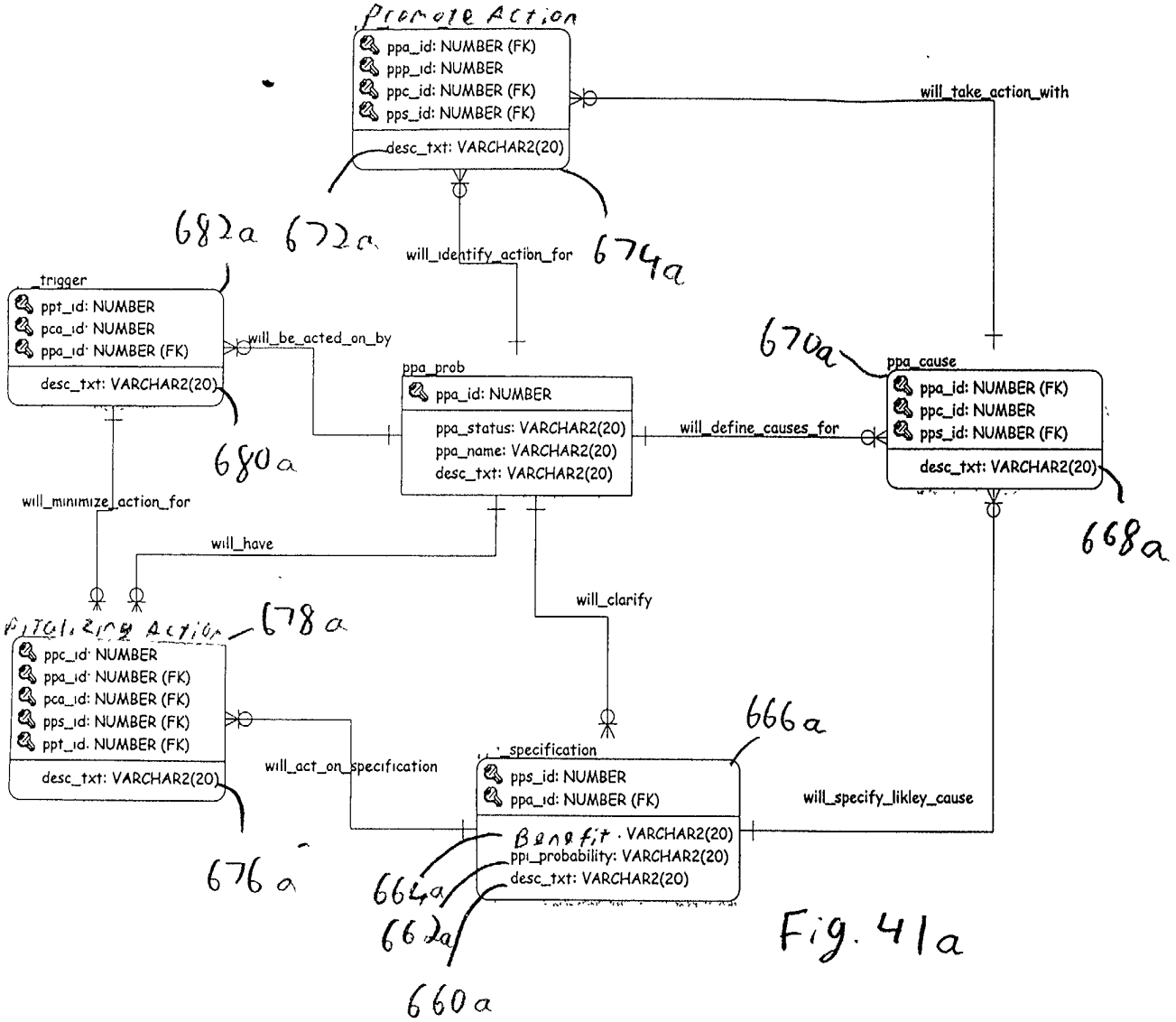


Fig. 41a

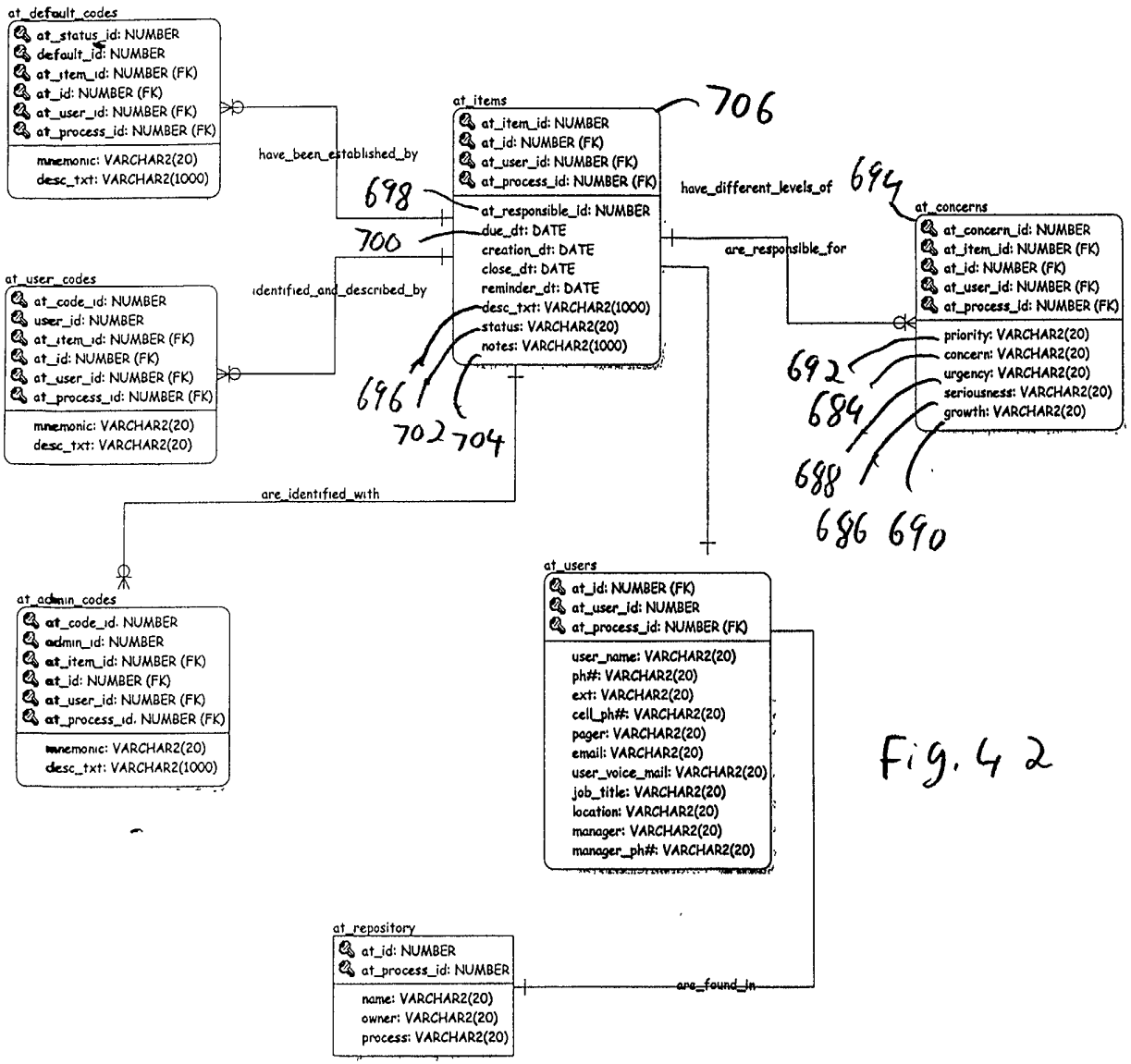


Fig. 42

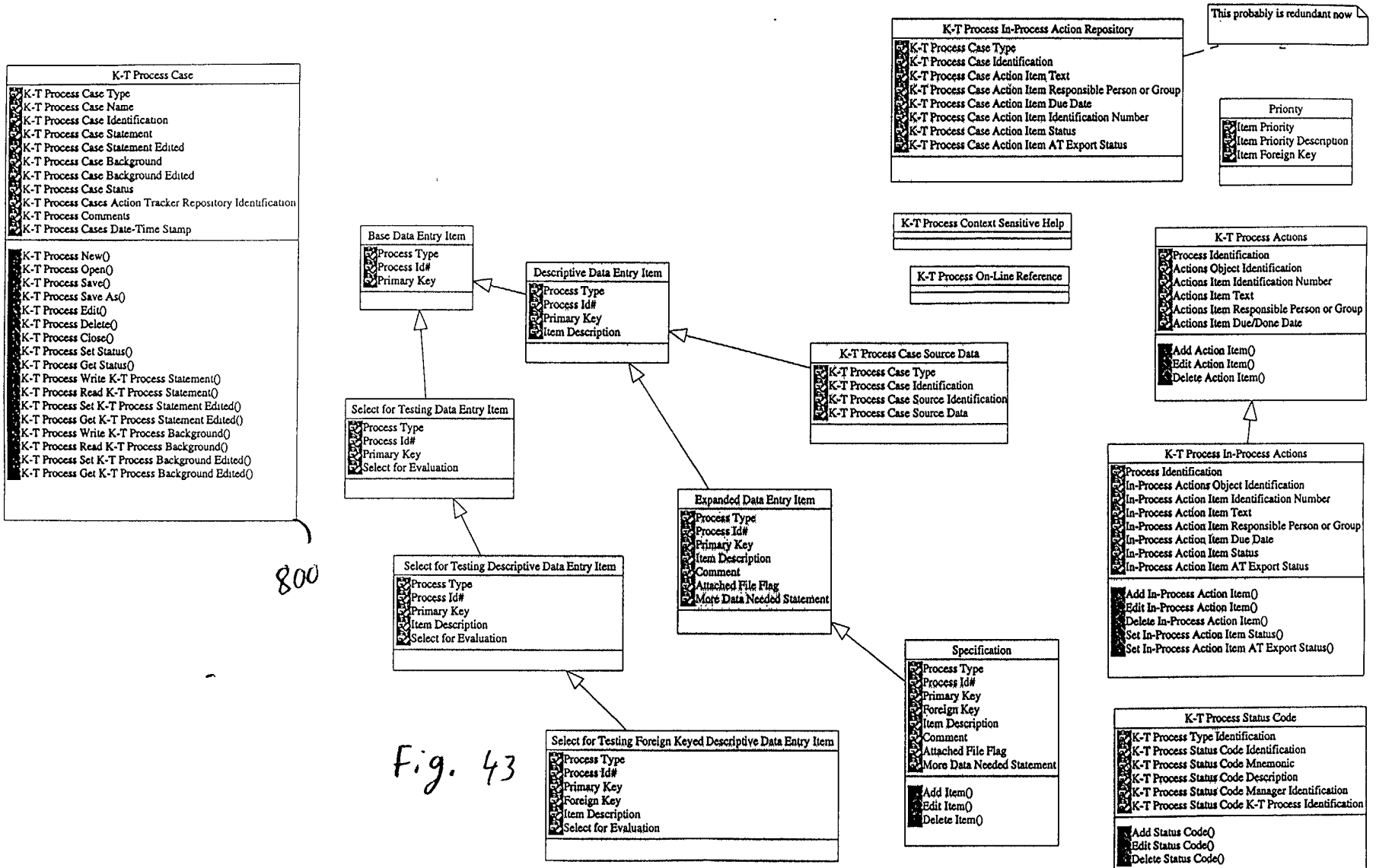

K-T Process Case
K-T Process Case Type
K-T Process Case Name
K-T Process Case Identification
K-T Process Case Statement
K-T Process Case Statement Edited
K-T Process Case Background
K-T Process Case Background Edited
K-T Process Case Status
K-T Process Cases Action Tracker Repository Identification
K-T Process Comments
K-T Process Cases Date-Time Stamp
K-T Process New()
K-T Process Open()
K-T Process Save()
K-T Process Save As()
K-T Process Edit()
K-T Process Delete()
K-T Process Close()
K-T Process Set Status()
K-T Process Get Status()
K-T Process Write K-T Process Statement()
K-T Process Read K-T Process Statement()
K-T Process Set K-T Process Statement Edited()
K-T Process Get K-T Process Statement Edited()
K-T Process Write K-T Process Background()
K-T Process Read K-T Process Background()
K-T Process Set K-T Process Background Edited()
K-T Process Get K-T Process Background Edited()
800
K-T Process In-Process Action Repository
K-T Process Case Type
K-T Process Case Identification
K-T Process Case Action Item Text
K-T Process Case Action Item Responsible Person or Group
K-T Process Case Action Item Due Date
K-T Process Case Action Item Identification Number
K-T Process Case Action Item Status
K-T Process Case Action Item AT Export Status
This probably is redundant now
Priority
Item Priority
Item Priority Description
Item Foreign Key
K-T Process Context Sensitive Help
K-T Process On-Line Reference
Base Data Entry Item
Process Type
Process Id#
Primary Key
Descriptive Data Entry Item
Process Type
Process Id#
Primary Key
Item Description
K-T Process Case Source Data
K-T Process Case Type
K-T Process Case Identification
K-T Process Case Source Identification
K-T Process Case Source Data
K-T Process Actions
Process Identification
Actions Object Identification
Actions Item Identification Number
Actions Item Text
Actions Item Responsible Person or Group
Actions Item Due/Done Date
Add Action Item()
Edit Action Item()
Delete Action Item()
Select for Testing Data Entry Item
Process Type
Process Id#
Primary Key
Select for Evaluation
Expanded Data Entry Item
Process Type
Process Id#
Primary Key
Item Description
Comment
Attached File Flag
More Data Needed Statement
K-T Process In-Process Actions
Process Identification
In-Process Actions Object Identification
In-Process Action Item Identification Number
In-Process Action Item Text
In-Process Action Item Responsible Person or Group
In-Process Action Item Due Date
In-Process Action Item Status
In-Process Action Item AT Export Status
Add In-Process Action Item()
Edit In-Process Action Item()
Delete In-Process Action Item()
Set In-Process Action Item Status()
Set In-Process Action Item AT Export Status()
Select for Testing Descriptive Data Entry Item
Process Type
Process Id#
Primary Key
Item Description
Select for Evaluation
Specification
Process Type
Process Id#
Primary Key
Foreign Key
Item Description
Comment
Attached File Flag
More Data Needed Statement
Add Item()
Edit Item()
Delete Item()
K-T Process Status Code
K-T Process Type Identification
K-T Process Status Code Identification
K-T Process Status Code Mnemonic
K-T Process Status Code Description
K-T Process Status Code Manager Identification
K-T Process Status Code K-T Process Identification
Add Status Code()
Edit Status Code()
Delete Status Code()
Select for Testing Foreign Keyed Descriptive Data Entry Item
Process Type
Process Id#
Primary Key
Foreign Key
Item Description
Select for Evaluation

Fig. 43

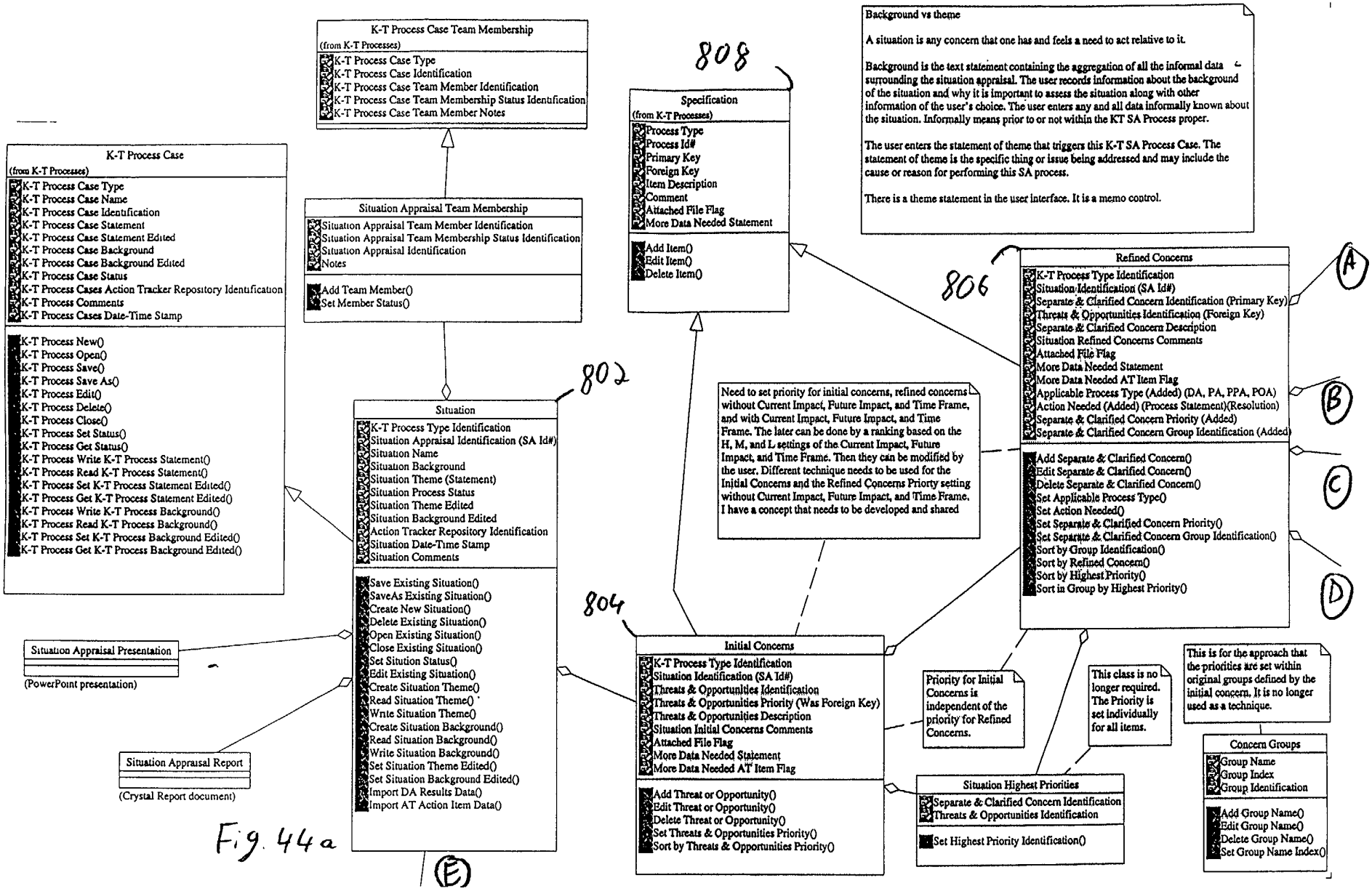


Fig. 44a

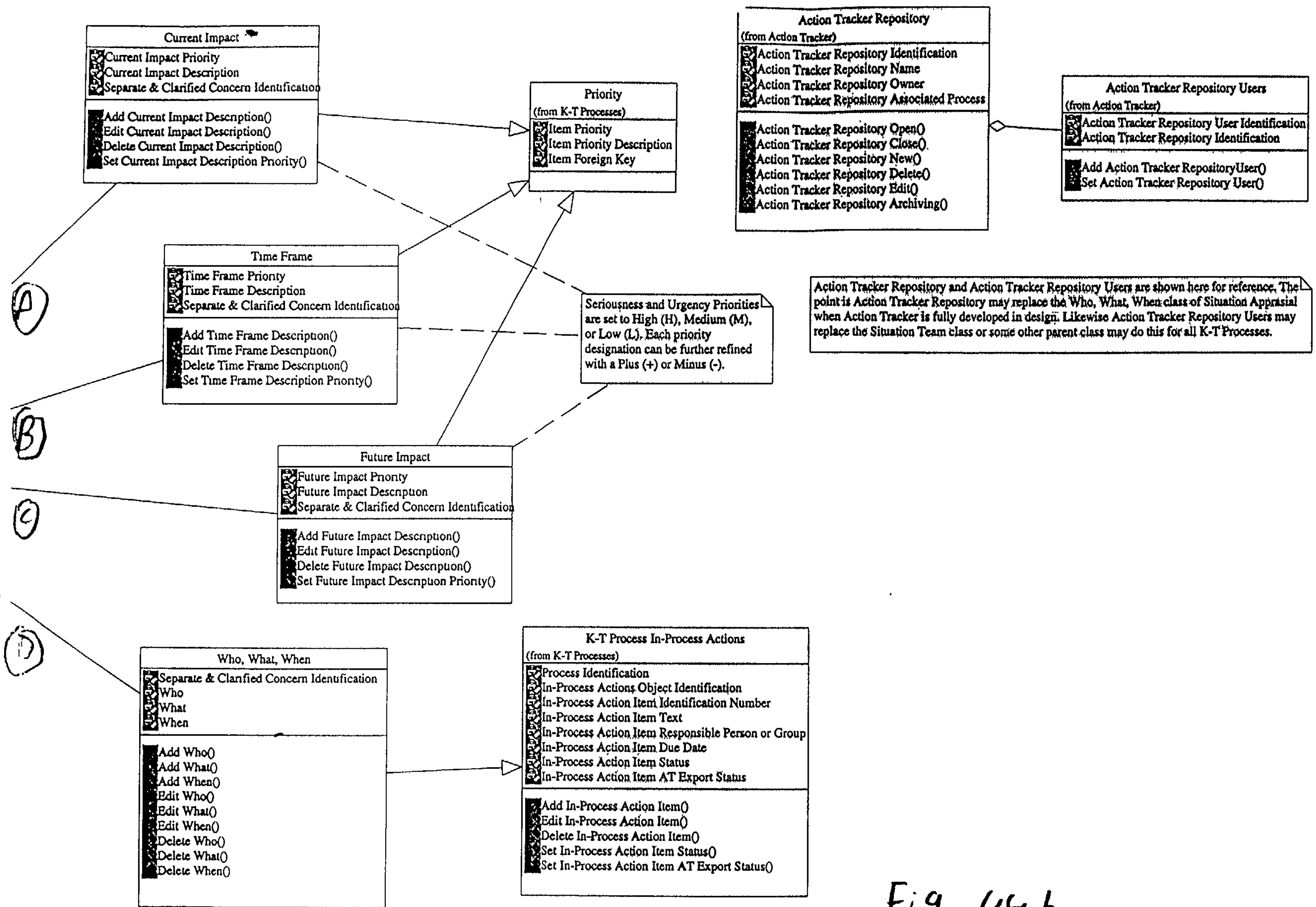
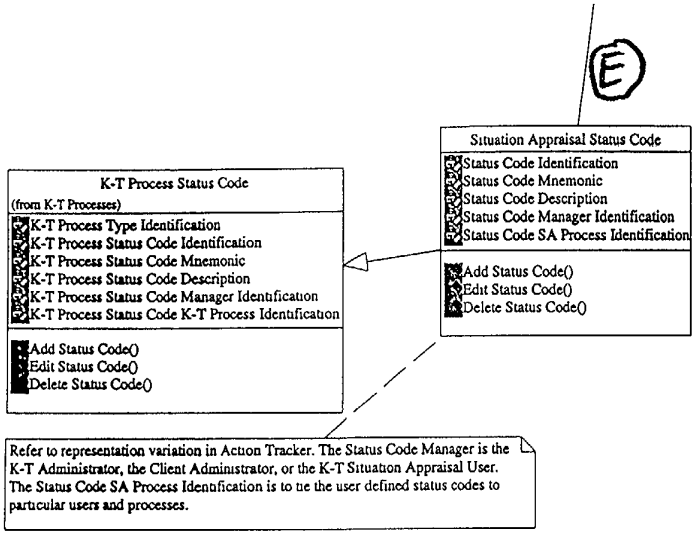

Current Impact
Current Impact Priority
Current Impact Description
Separate & Clarified Concern Identification
Add Current Impact Description()
Edit Current Impact Description()
Delete Current Impact Description()
Set Current Impact Description Priority()
Priority
(from K-T Processes)
Item Priority
Item Priority Description
Item Foreign Key
Action Tracker Repository
(from Action Tracker)
Action Tracker Repository Identification
Action Tracker Repository Name
Action Tracker Repository Owner
Action Tracker Repository Associated Process
Action Tracker Repository Open()
Action Tracker Repository Close()
Action Tracker Repository New()
Action Tracker Repository Delete()
Action Tracker Repository Edit()
Action Tracker Repository Archiving()
Action Tracker Repository Users
(from Action Tracker)
Action Tracker Repository User Identification
Action Tracker Repository Identification
Add Action Tracker RepositoryUser()
Set Action Tracker Repository User()
Time Frame
Time Frame Priority
Time Frame Description
Separate & Clarified Concern Identification
Add Time Frame Description()
Edit Time Frame Description()
Delete Time Frame Description()
Set Time Frame Description Priority()
Seriousness and Urgency Priorities are set to High (H), Medium (M), or Low (L). Each priority designation can be further refined with a Plus (+) or Minus (-).
Action Tracker Repository and Action Tracker Repository Users are shown here for reference. The point is Action Tracker Repository may replace the Who, What, When class of Situation Appraisal when Action Tracker is fully developed in design. Likewise Action Tracker Repository Users may replace the Situation Team class or some other parent class may do this for all K-T Processes.
A
B
C
D
Future Impact
Future Impact Priority
Future Impact Description
Separate & Clarified Concern Identification
Add Future Impact Description()
Edit Future Impact Description()
Delete Future Impact Description()
Set Future Impact Description Priority()
Who, What, When
Separate & Clarified Concern Identification
Who
What
When
Add Who()
Add What()
Add When()
Edit Who()
Edit What()
Edit When()
Delete Who()
Delete What()
Delete When()
K-T Process In-Process Actions
(from K-T Processes)
Process Identification
In-Process Actions Object Identification
In-Process Action Item Identification Number
In-Process Action Item Text
In-Process Action Item Responsible Person or Group
In-Process Action Item Due Date
In-Process Action Item Status
In-Process Action Item AT Export Status
Add In-Process Action Item()
Edit In-Process Action Item()
Delete In-Process Action Item()
Set In-Process Action Item Status()
Set In-Process Action Item AT Export Status()

Fig. 44b



Establish priority:
Select a concern that seems to be the highest priority.
Select another and place it above or below the first concern in priority.
Select a third and place it relative to the first two concerns, Use drag and drop graphically.
Select additional concerns sequentially and place as above.
Select those that represent the group clasified as H for High Priority and designate as such.
Select from the remainder those that represent the group clasified asM for MediumPriority and designate as such.
The remainder are classified as L for Low Priority and are designated as such.

Karl,

As a follow up to our discussion, I want to confirm that we do need some type of ordering control in the SA grid on the initial "list concerns" screens. We may also want to allow this on the "separate and clarify" grid; however, in this case, the user could still only order the parent cells (with the children following the parents). they could not order children cells individually.

I can see where this functionality could be useful any time we have a single-column grid, such as in DA (list Objectives and List Alternatives) and PPA/POA (list Potential Problems/Opportunities).

Nikki

Fig. 44c

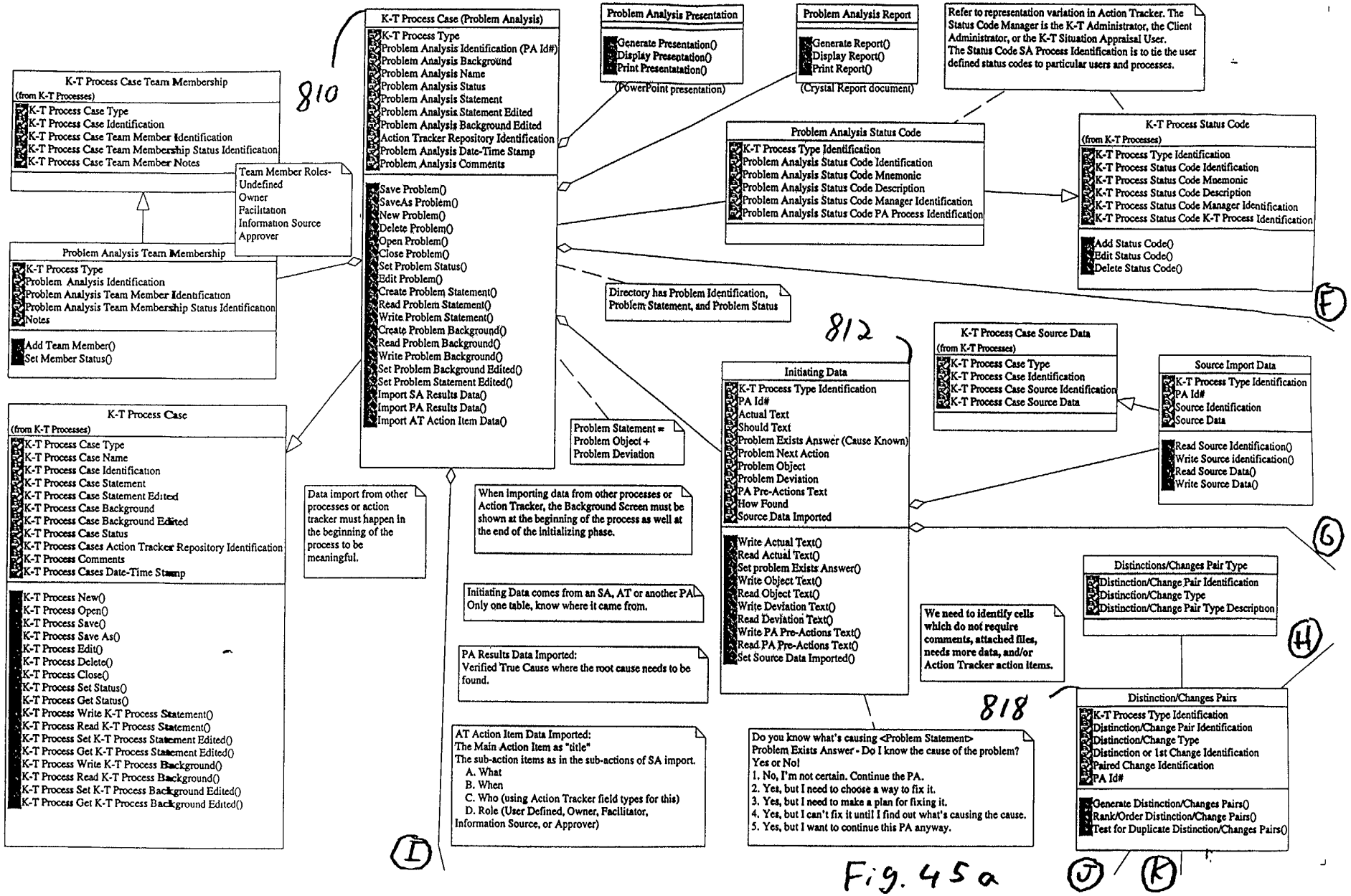


Fig. 45a

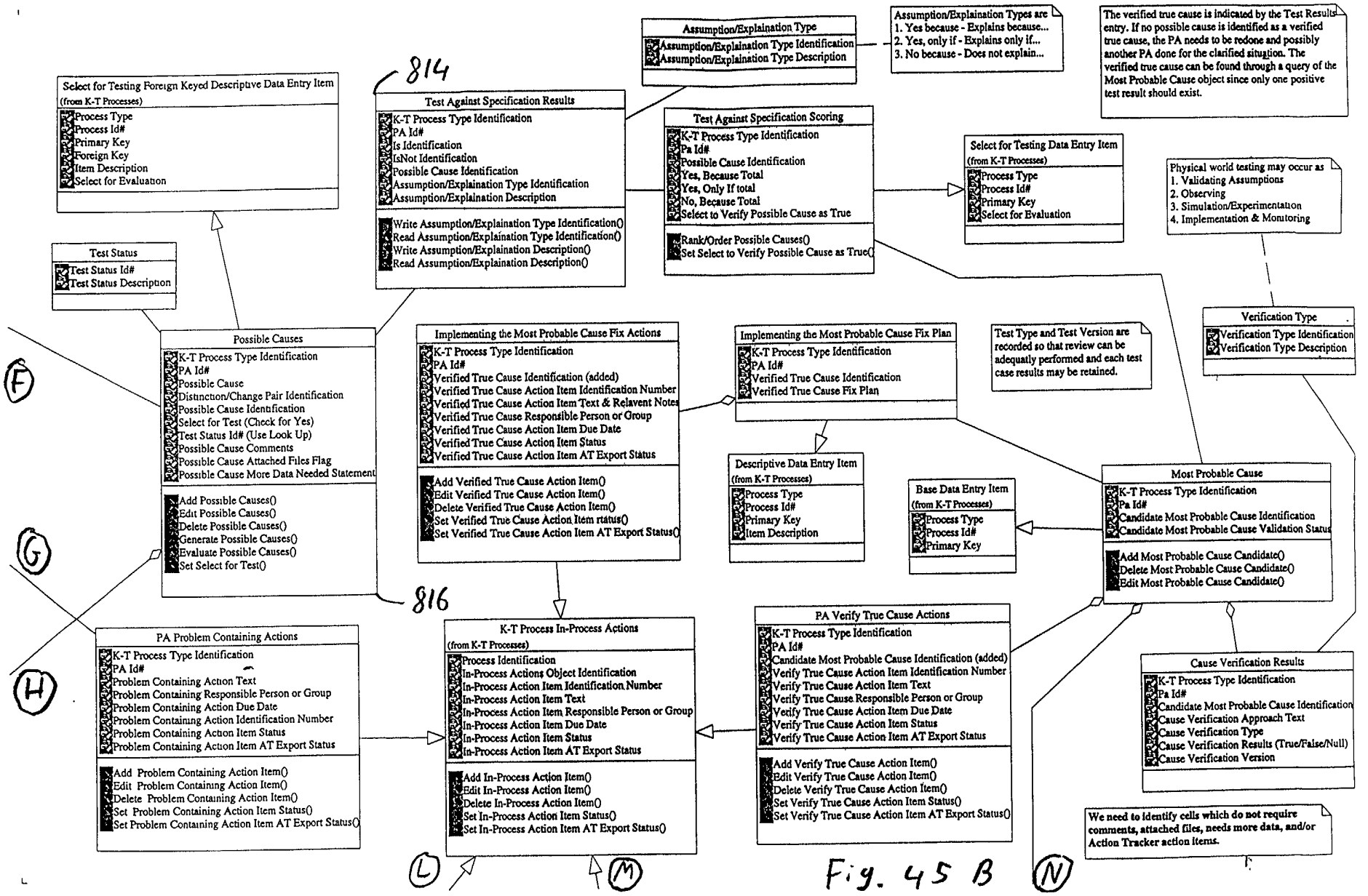


Fig. 45 B

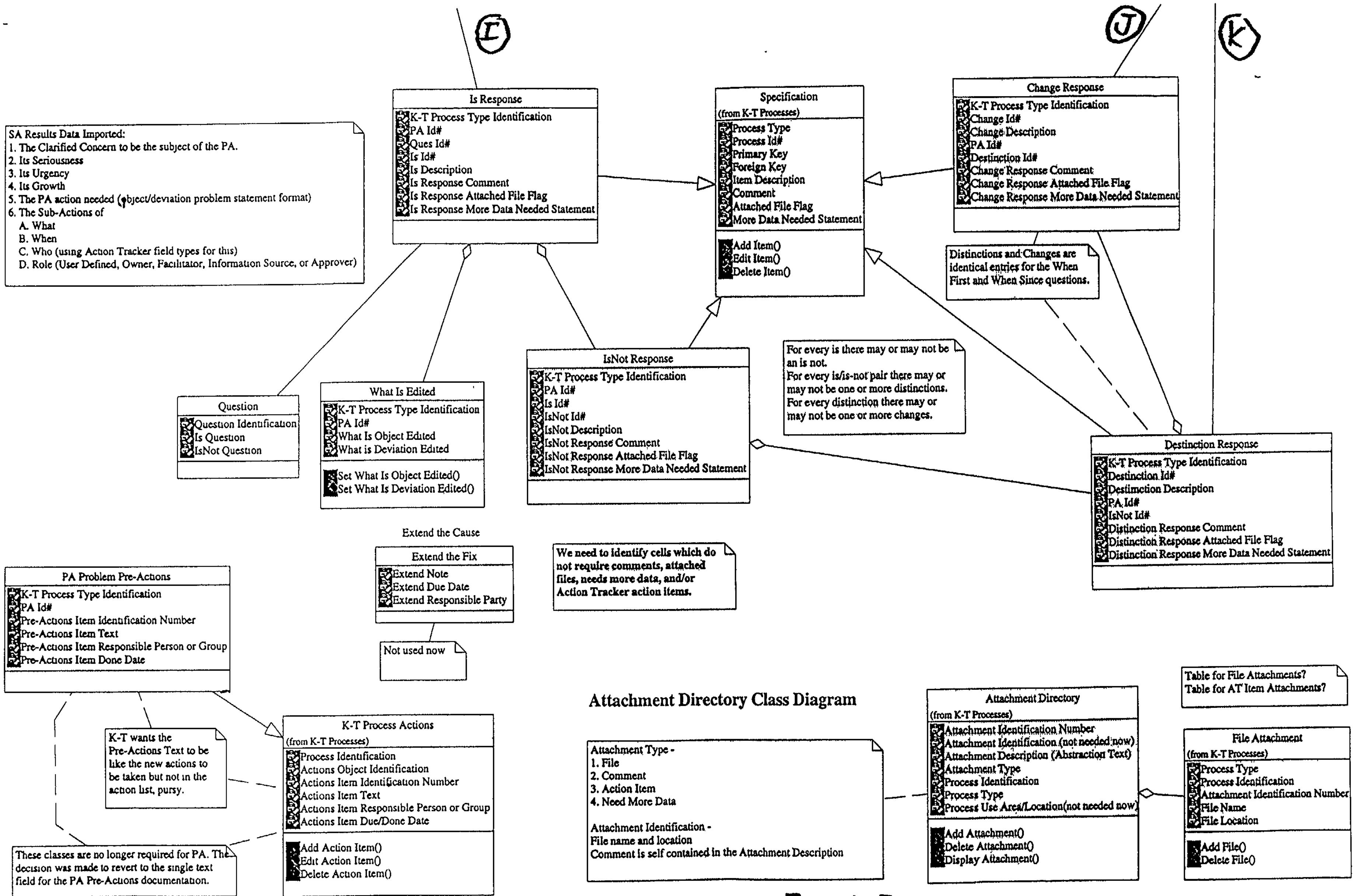

Is Response
K-T Process Type Identification
PA Id#
Ques Id#
Is Id#
Is Description
Is Response Comment
Is Response Attached File Flag
Is Response More Data Needed Statement
Specification
(from K-T Processes)
Process Type
Process Id#
Primary Key
Foreign Key
Item Description
Comment
Attached File Flag
More Data Needed Statement
Add Item()
Edit Item()
Delete Item()
Change Response
K-T Process Type Identification
Change Id#
Change Description
PA Id#
Destinction Id#
Change Response Comment
Change Response Attached File Flag
Change Response More Data Needed Statement
SA Results Data Imported:
1. The Clarified Concern to be the subject of the PA.
2. Its Seriousness
3. Its Urgency
4. Its Growth
5. The PA action needed (object/deviation problem statement format)
6. The Sub-Actions of
A. What
B. When
C. Who (using Action Tracker field types for this)
D. Role (User Defined, Owner, Facilitator, Information Source, or Approver)
Distinctions and Changes are identical entries for the When First and When Since questions.
For every is there may or may not be an is not.
For every is/is-not pair there may or may not be one or more distinctions.
For every distinction there may or may not be one or more changes.
Question
Question Identification
Is Question
IsNot Question
What Is Edited
K-T Process Type Identification
PA Id#
What Is Object Edited
What is Deviation Edited
Set What Is Object Edited()
Set What Is Deviation Edited()
IsNot Response
K-T Process Type Identification
PA Id#
Is Id#
IsNot Id#
IsNot Description
IsNot Response Comment
IsNot Response Attached File Flag
IsNot Response More Data Needed Statement
Destinction Response
K-T Process Type Identification
Destinction Id#
Destimction Description
PA Id#
IsNot Id#
Distinction Response Comment
Distinction Response Attached File Flag
Distinction Response More Data Needed Statement
Extend the Cause
Extend the Fix
Extend Note
Extend Due Date
Extend Responsible Party
Not used now
We need to identify cells which do not require comments, attached files, needs more data, and/or Action Tracker action items.
PA Problem Pre-Actions
K-T Process Type Identification
PA Id#
Pre-Actions Item Identification Number
Pre-Actions Item Text
Pre-Actions Item Responsible Person or Group
Pre-Actions Item Done Date
K-T wants the Pre-Actions Text to be like the new actions to be taken but not in the action list, pursy.
These classes are no longer required for PA. The decision was made to revert to the single text field for the PA Pre-Actions documentation.
K-T Process Actions
(from K-T Processes)
Process Identification
Actions Object Identification
Actions Item Identification Number
Actions Item Text
Actions Item Responsible Person or Group
Actions Item Due/Done Date
Add Action Item()
Edit Action Item()
Delete Action Item()
Attachment Directory Class Diagram
Attachment Type -
1. File
2. Comment
3. Action Item
4. Need More Data
Attachment Identification -
File name and location
Comment is self contained in the Attachment Description
Attachment Directory
(from K-T Processes)
Attachment Identification Number
Attachment Identification (not needed now)
Attachment Description (Abstraction Text)
Attachment Type
Process Identification
Process Type
Process Use Area/Location(not needed now)
Add Attachment()
Delete Attachment()
Display Attachment()
Table for File Attachments?
Table for AT Item Attachments?
File Attachment
(from K-T Processes)
Process Type
Process Identification
Attachment Identification Number
File Name
File Location
Add File()
Delete File()
E
J
K

Fig. 45c

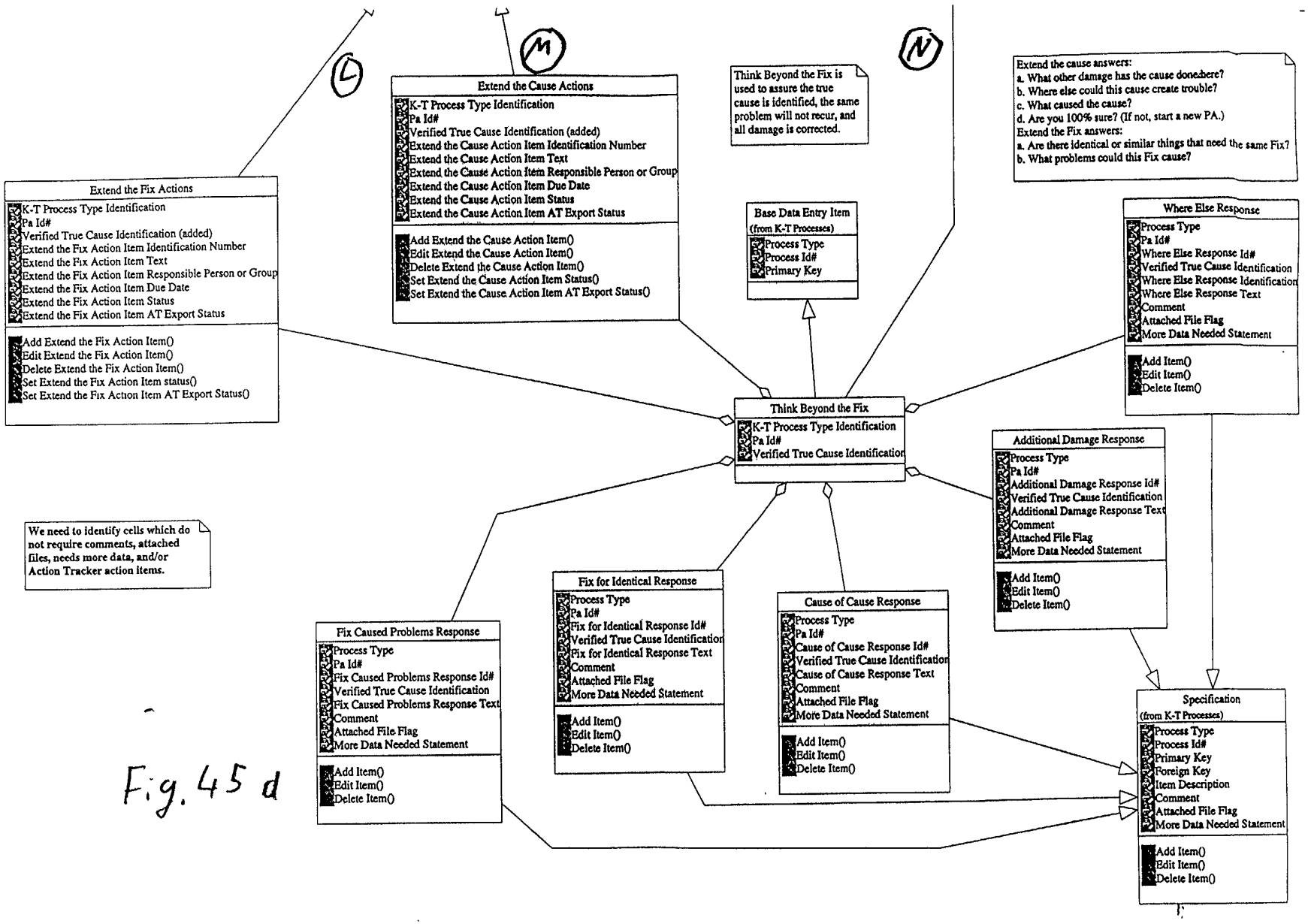


Fig. 45 d

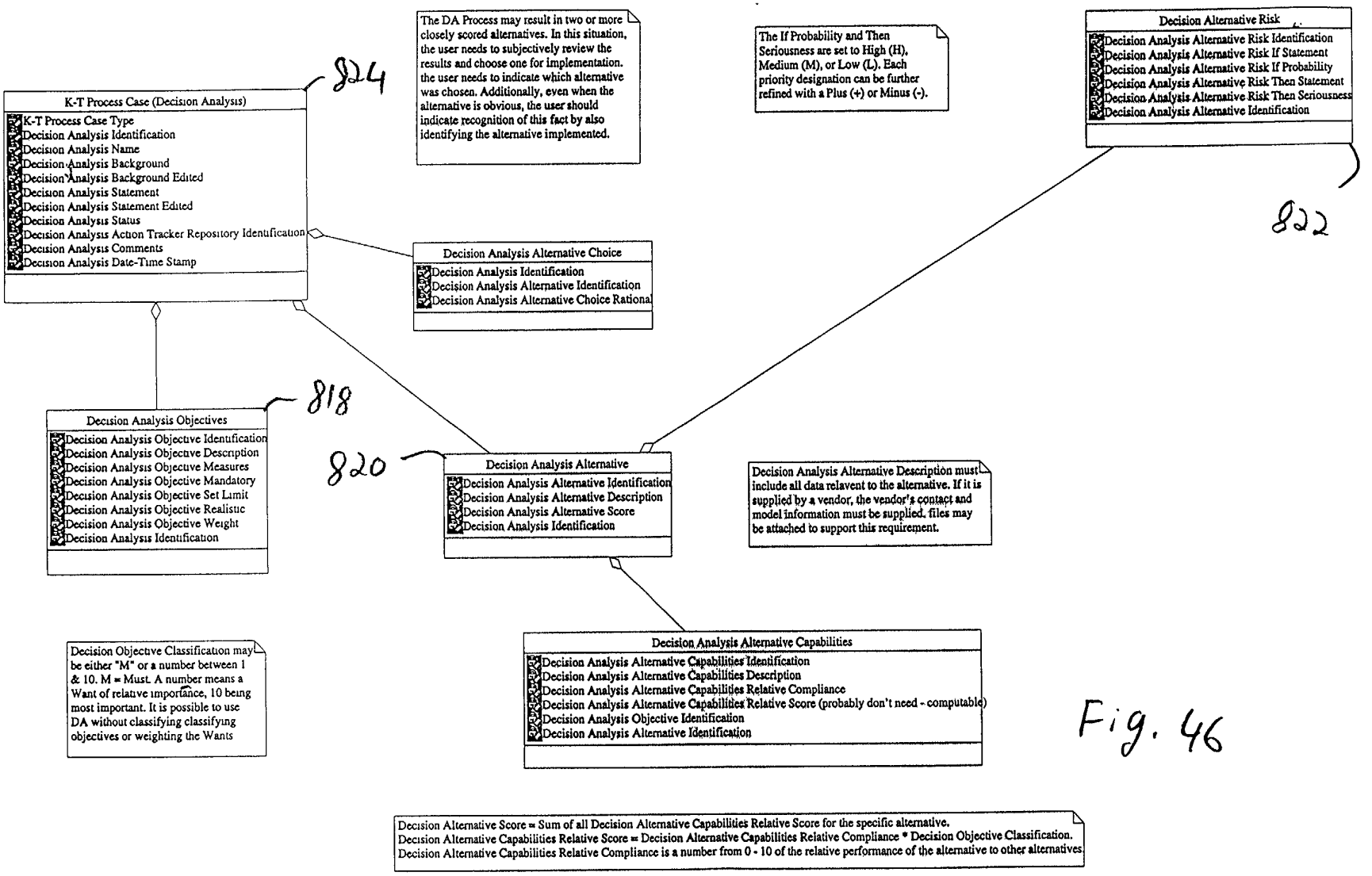

824
K-T Process Case (Decision Analysis)
K-T Process Case Type
Decision Analysis Identification
Decision Analysis Name
Decision Analysis Background
Decision Analysis Background Edited
Decision Analysis Statement
Decision Analysis Statement Edited
Decision Analysis Status
Decision Analysis Action Tracker Repository Identification
Decision Analysis Comments
Decision Analysis Date-Time Stamp
The DA Process may result in two or more closely scored alternatives. In this situation, the user needs to subjectively review the results and choose one for implementation. the user needs to indicate which alternative was chosen. Additionally, even when the alternative is obvious, the user should indicate recognition of this fact by also identifying the alternative implemented.
The If Probability and Then Seriousness are set to High (H), Medium (M), or Low (L). Each priority designation can be further refined with a Plus (+) or Minus (-).
Decision Alternative Risk
Decision Analysis Alternative Risk Identification
Decision Analysis Alternative Risk If Statement
Decision Analysis Alternative Risk If Probability
Decision Analysis Alternative Risk Then Statement
Decision Analysis Alternative Risk Then Seriousness
Decision Analysis Alternative Identification
822
Decision Analysis Alternative Choice
Decision Analysis Identification
Decision Analysis Alternative Identification
Decision Analysis Alternative Choice Rational
818
Decision Analysis Objectives
Decision Analysis Objective Identification
Decision Analysis Objective Description
Decision Analysis Objective Measures
Decision Analysis Objective Mandatory
Decision Analysis Objective Set Limit
Decision Analysis Objective Realistic
Decision Analysis Objective Weight
Decision Analysis Identification
820
Decision Analysis Alternative
Decision Analysis Alternative Identification
Decision Analysis Alternative Description
Decision Analysis Alternative Score
Decision Analysis Identification
Decision Analysis Alternative Description must include all data relavent to the alternative. If it is supplied by a vendor, the vendor's contact and model information must be supplied. files may be attached to support this requirement.
Decision Objective Classification may be either "M" or a number between 1 & 10. M = Must. A number means a Want of relative importance, 10 being most important. It is possible to use DA without classifying classifying objectives or weighting the Wants
Decision Analysis Alternative Capabilities
Decision Analysis Alternative Capabilities Identification
Decision Analysis Alternative Capabilities Description
Decision Analysis Alternative Capabilities Relative Compliance
Decision Analysis Alternative Capabilities Relative Score (probably don't need - computable)
Decision Analysis Objective Identification
Decision Analysis Alternative Identification
Decision Alternative Score = Sum of all Decision Alternative Capabilities Relative Score for the specific alternative.
Decision Alternative Capabilities Relative Score = Decision Alternative Capabilities Relative Compliance * Decision Objective Classification.
Decision Alternative Capabilities Relative Compliance is a number from 0 - 10 of the relative performance of the alternative to other alternatives.

Fig. 46

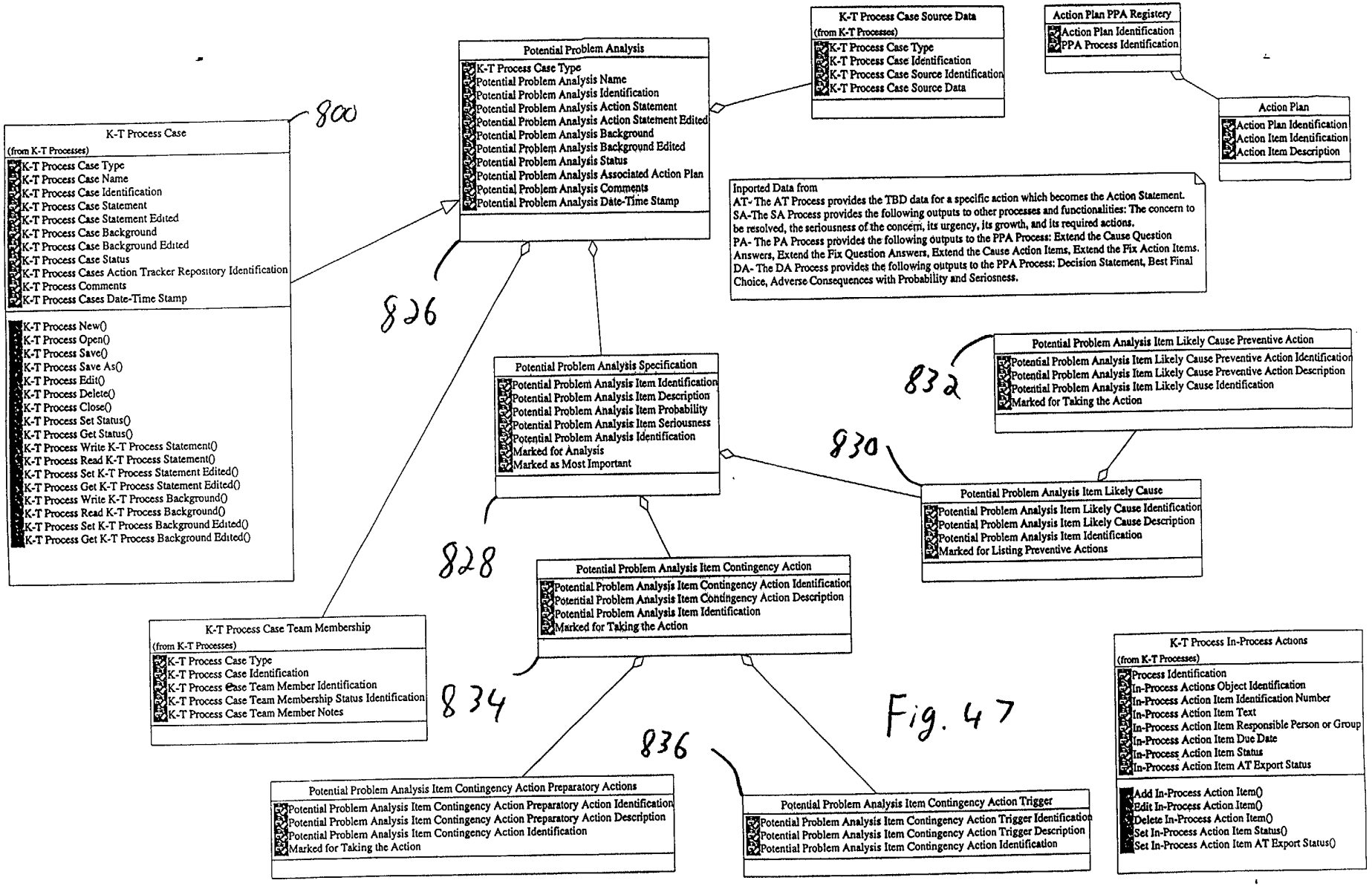


Fig. 47

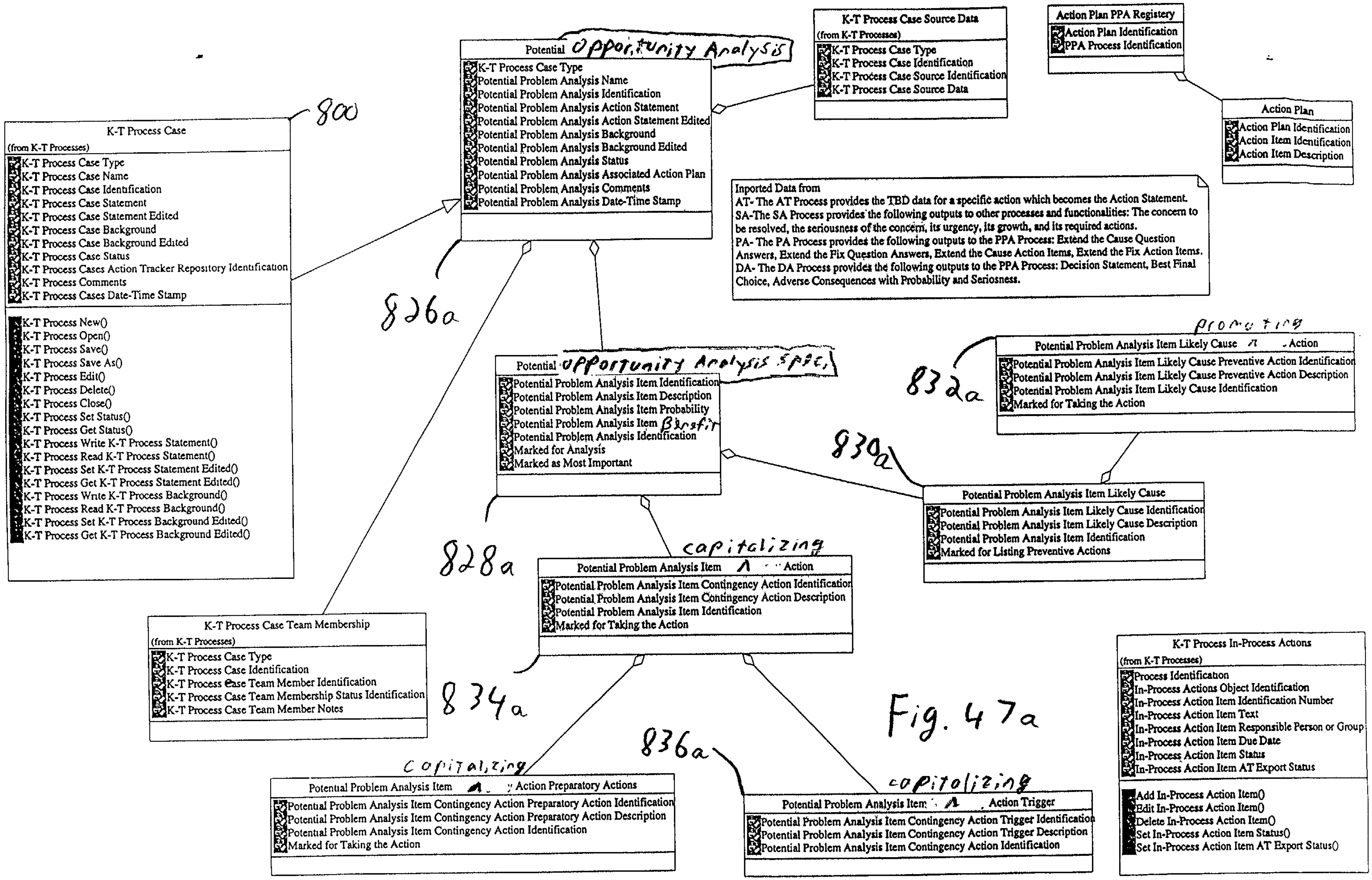

800
K-T Process Case
(from K-T Processes)
K-T Process Case Type
K-T Process Case Name
K-T Process Case Identification
K-T Process Case Statement
K-T Process Case Statement Edited
K-T Process Case Background
K-T Process Case Background Edited
K-T Process Case Status
K-T Process Cases Action Tracker Repository Identification
K-T Process Comments
K-T Process Cases Date-Time Stamp
K-T Process New()
K-T Process Open()
K-T Process Save()
K-T Process Save As()
K-T Process Edit()
K-T Process Delete()
K-T Process Close()
K-T Process Set Status()
K-T Process Get Status()
K-T Process Write K-T Process Statement()
K-T Process Read K-T Process Statement()
K-T Process Set K-T Process Statement Edited()
K-T Process Get K-T Process Statement Edited()
K-T Process Write K-T Process Background()
K-T Process Read K-T Process Background()
K-T Process Set K-T Process Background Edited()
K-T Process Get K-T Process Background Edited()
Potential Opportunity Analysis
K-T Process Case Type
Potential Problem Analysis Name
Potential Problem Analysis Identification
Potential Problem Analysis Action Statement
Potential Problem Analysis Action Statement Edited
Potential Problem Analysis Background
Potential Problem Analysis Background Edited
Potential Problem Analysis Status
Potential Problem Analysis Associated Action Plan
Potential Problem Analysis Comments
Potential Problem Analysis Date-Time Stamp
K-T Process Case Source Data
(from K-T Processes)
K-T Process Case Type
K-T Process Case Identification
K-T Process Case Source Identification
K-T Process Case Source Data
Action Plan PPA Registry
Action Plan Identification
PPA Process Identification
Action Plan
Action Plan Identification
Action Item Identification
Action Item Description
Inported Data from
AT- The AT Process provides the TBD data for a specific action which becomes the Action Statement.
SA-The SA Process provides the following outputs to other processes and functionalities: The concern to be resolved, the seriousness of the concern, its urgency, its growth, and its required actions.
PA- The PA Process provides the following outputs to the PPA Process: Extend the Cause Question Answers, Extend the Fix Question Answers, Extend the Cause Action Items, Extend the Fix Action Items.
DA- The DA Process provides the following outputs to the PPA Process: Decision Statement, Best Final Choice, Adverse Consequences with Probability and Seriosness.
826a
Potential Opportunity Analysis Spec,
Potential Problem Analysis Item Identification
Potential Problem Analysis Item Description
Potential Problem Analysis Item Probability
Potential Problem Analysis Item Benefit
Potential Problem Analysis Identification
Marked for Analysis
Marked as Most Important
promoting
Potential Problem Analysis Item Likely Cause Action
Potential Problem Analysis Item Likely Cause Preventive Action Identification
Potential Problem Analysis Item Likely Cause Preventive Action Description
Potential Problem Analysis Item Likely Cause Identification
Marked for Taking the Action
832a
830a
Potential Problem Analysis Item Likely Cause
Potential Problem Analysis Item Likely Cause Identification
Potential Problem Analysis Item Likely Cause Description
Potential Problem Analysis Item Identification
Marked for Listing Preventive Actions
828a
capitalizing
Potential Problem Analysis Item Action
Potential Problem Analysis Item Contingency Action Identification
Potential Problem Analysis Item Contingency Action Description
Potential Problem Analysis Item Identification
Marked for Taking the Action
K-T Process Case Team Membership
(from K-T Processes)
K-T Process Case Type
K-T Process Case Identification
K-T Process Case Team Member Identification
K-T Process Case Team Membership Status Identification
K-T Process Case Team Member Notes
834a
836a
capitalizing
Potential Problem Analysis Item Action Preparatory Actions
Potential Problem Analysis Item Contingency Action Preparatory Action Identification
Potential Problem Analysis Item Contingency Action Preparatory Action Description
Potential Problem Analysis Item Contingency Action Identification
Marked for Taking the Action
capitalizing
Potential Problem Analysis Item Action Trigger
Potential Problem Analysis Item Contingency Action Trigger Identification
Potential Problem Analysis Item Contingency Action Trigger Description
Potential Problem Analysis Item Contingency Action Identification
K-T Process In-Process Actions
(from K-T Processes)
Process Identification
In-Process Actions Object Identification
In-Process Action Item Identification Number
In-Process Action Item Text
In-Process Action Item Responsible Person or Group
In-Process Action Item Due Date
In-Process Action Item Status
In-Process Action Item AT Export Status
Add In-Process Action Item()
Edit In-Process Action Item()
Delete In-Process Action Item()
Set In-Process Action Item Status()
Set In-Process Action Item AT Export Status()

Fig. 47a

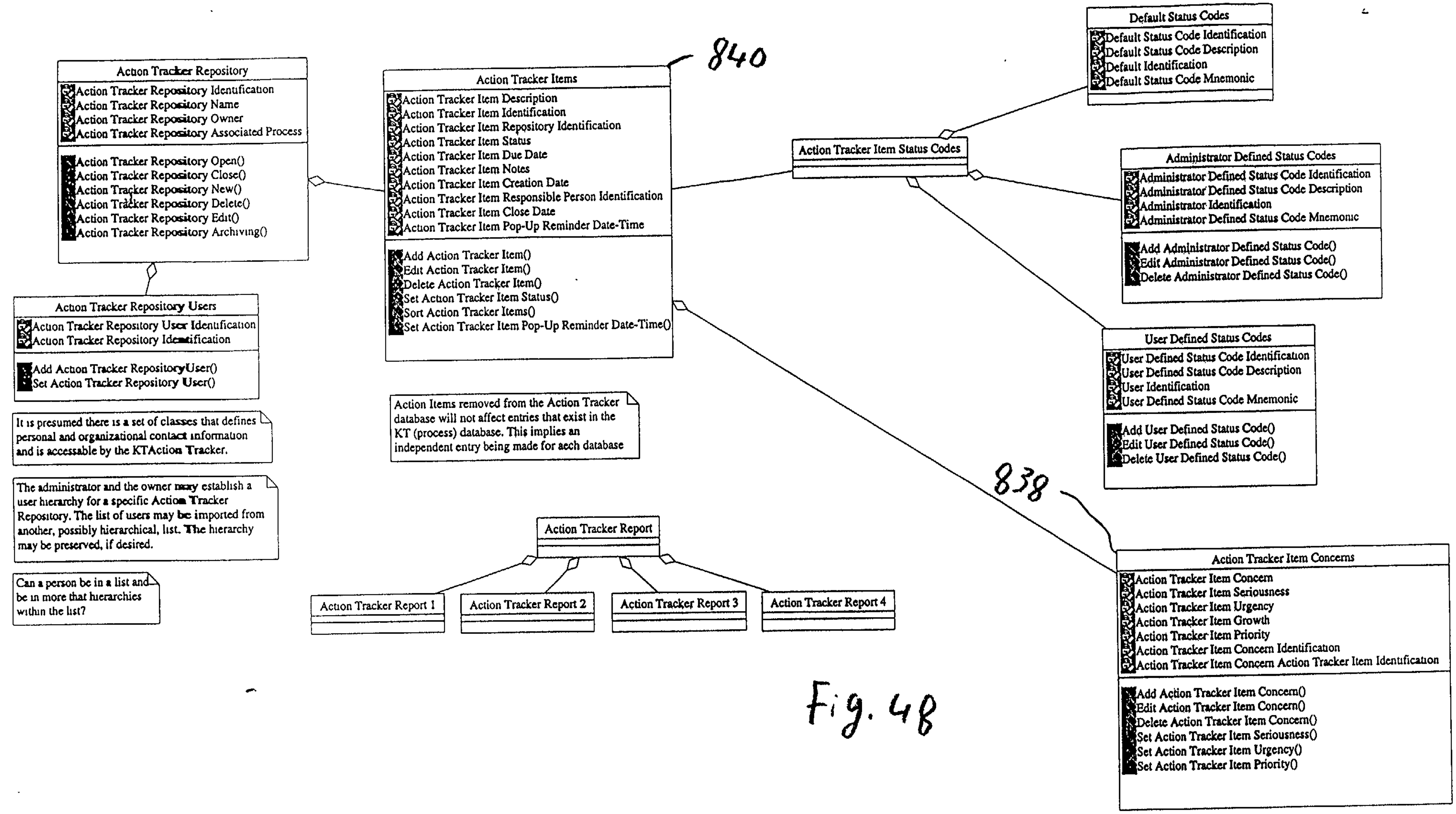
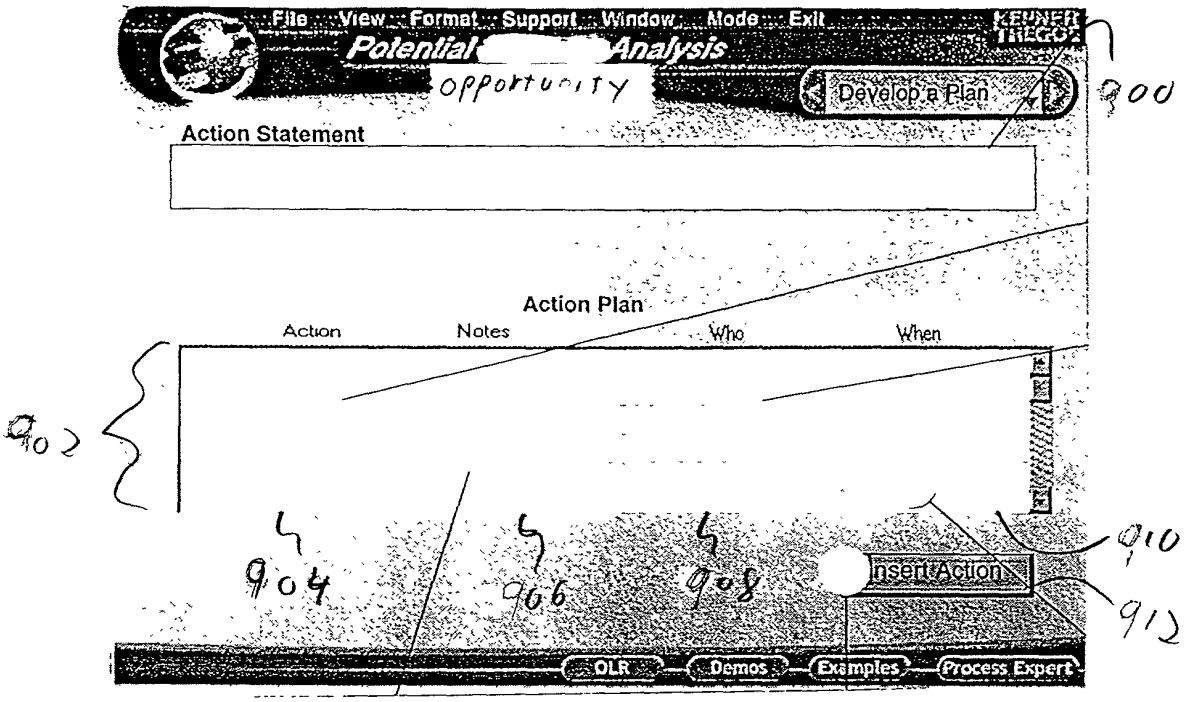
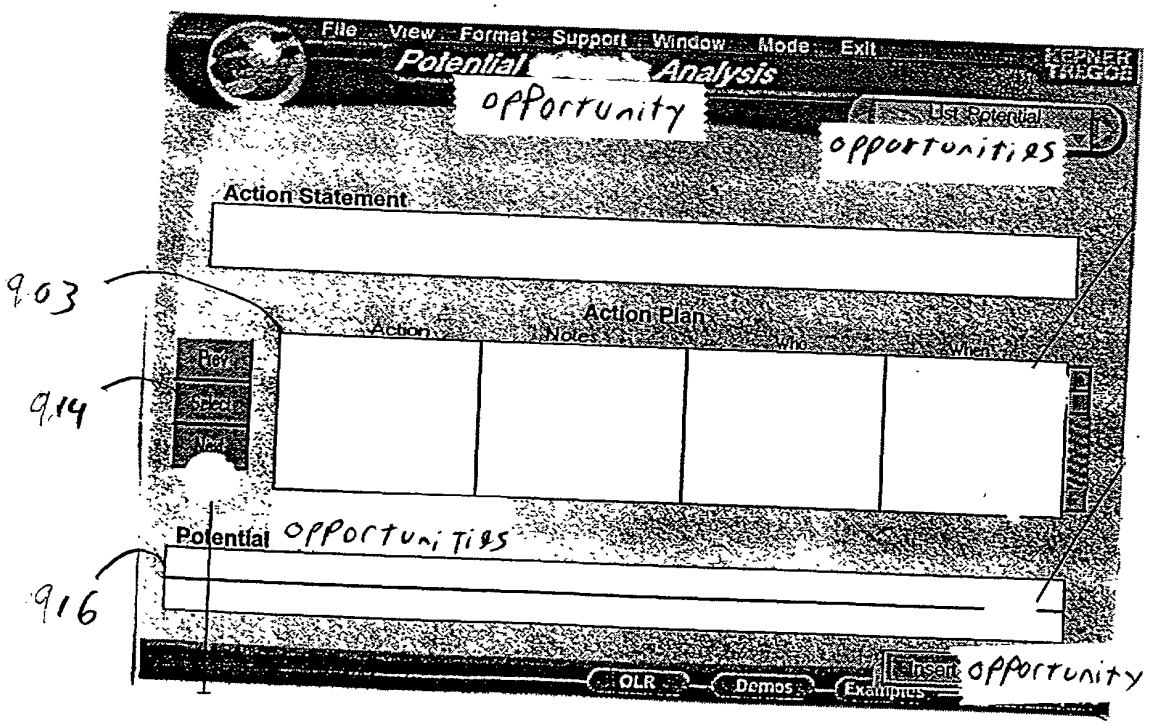


Fig. 48


File View Format Support Window Mode Exit
KEPNER TREGOE
Potential Analysis
opportunity
Develop a Plan
900
Action Statement
Action Plan
Action
Notes
Who
When
902
904
906
908
Insert Action
910
912
OLR
Demos
Examples
Process Expert

F:g. 49


File View Format Support Window Mode Exit
KEPNER TREGOE
Potential Analysis
opportunity
List Potential opportunities
Action Statement
903
Action Plan
Action
Notes
Who
When
914
Potential opportunities
916
OLR
Demos
Insert opportunity

F:g. 50

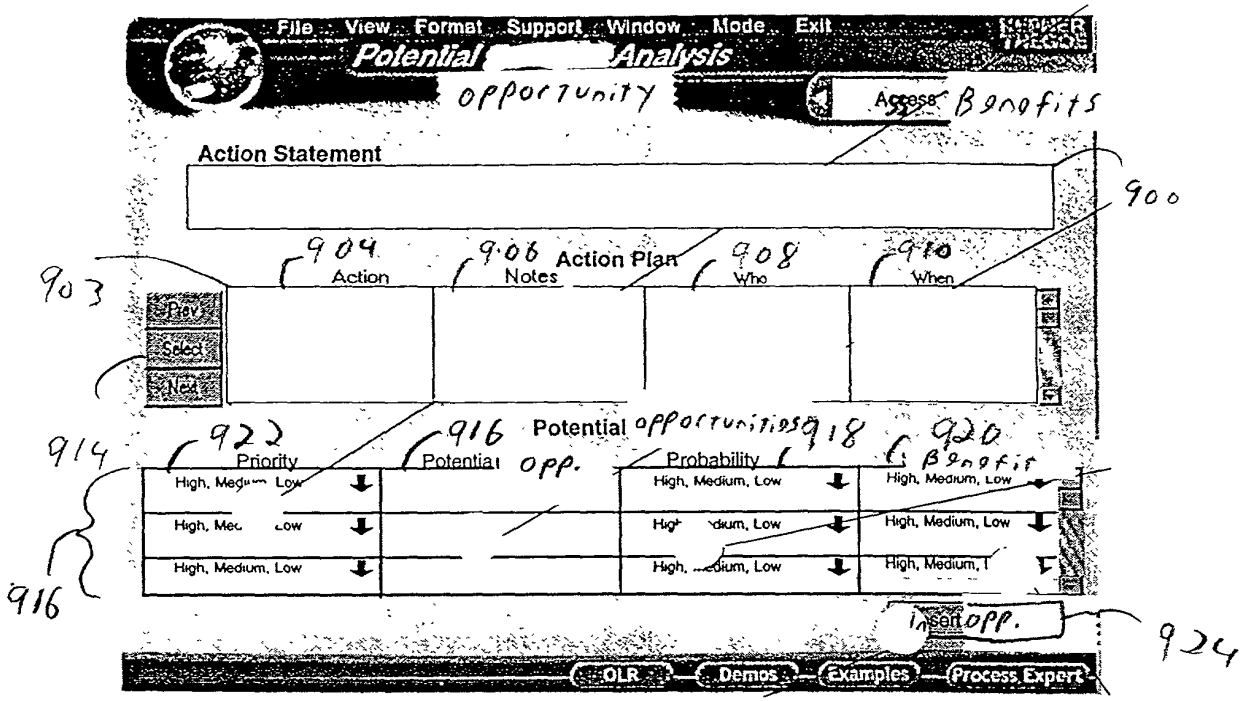

File View Format Support Window Mode Exit
Potential Analysis
opportunity
Access Benefits
Action Statement
900
903
904 Action
906 Notes
Action Plan
908 Who
910 When
Prev
Select
Next
914
916
922 Priority
916 Potential opp.
Potential opportunities
918 Probability
920 Benefit
High, Medium, Low
Insert Opp.
924
OLR
Demos
Examples
Process Expert

Fig. 51

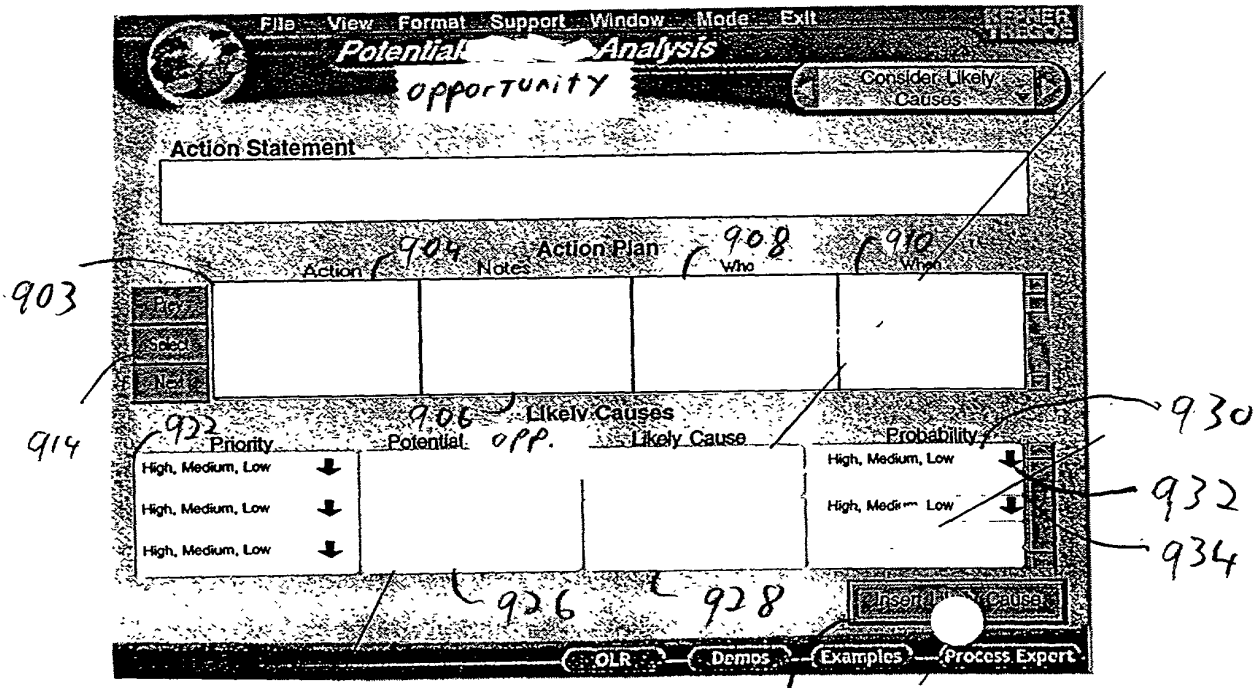

File View Format Support Window Mode Exit
Potential Analysis
opportunity
Consider Likely Causes
Action Statement
903
Action
904 Notes
Action Plan
908 Who
910 When
Prev
Select
Next
914
922 Priority
906 Potential opp.
Likely Causes
Likely Cause
Probability
930
932
934
High, Medium, Low
Insert Cause
926
928
OLR
Demos
Examples
Process Expert
936

Fig. 52

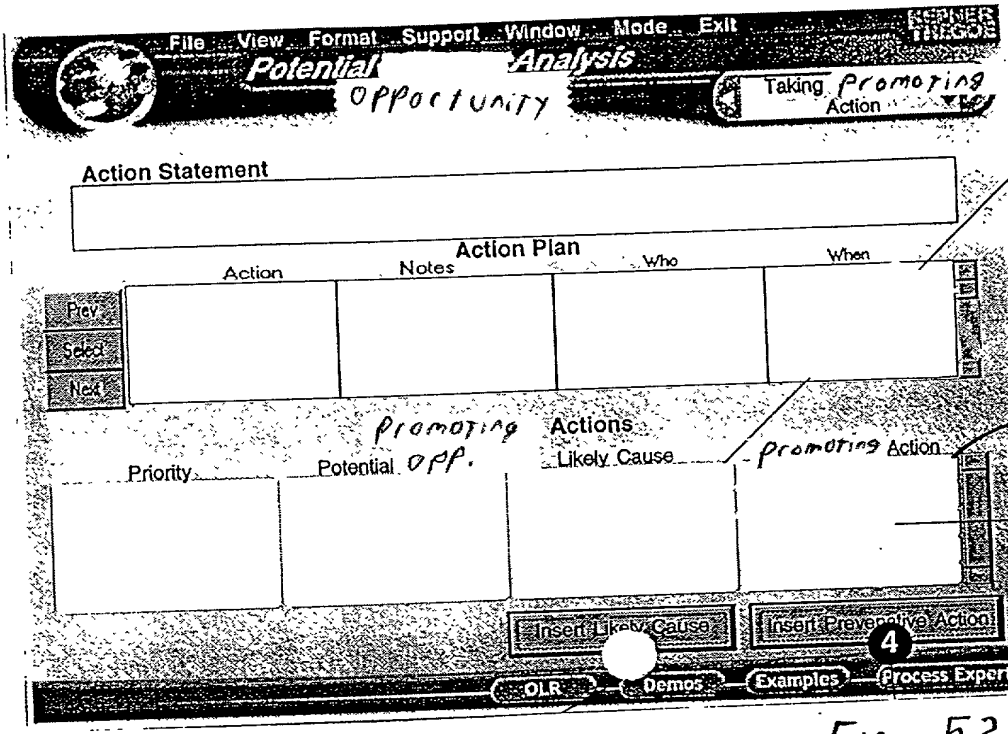
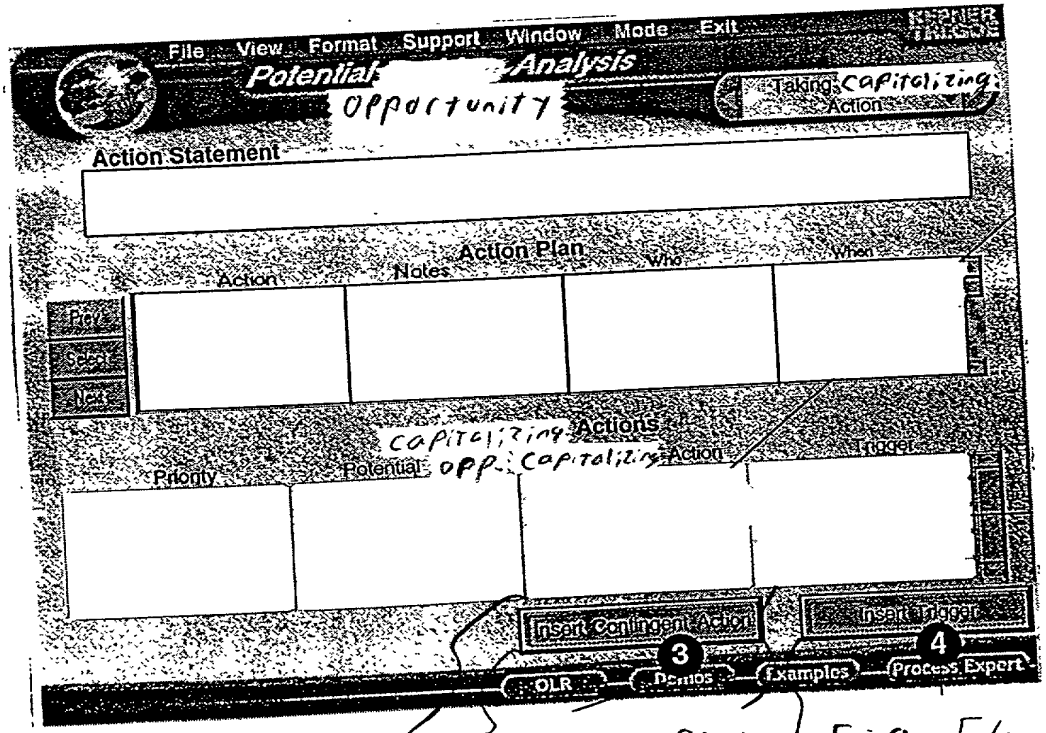
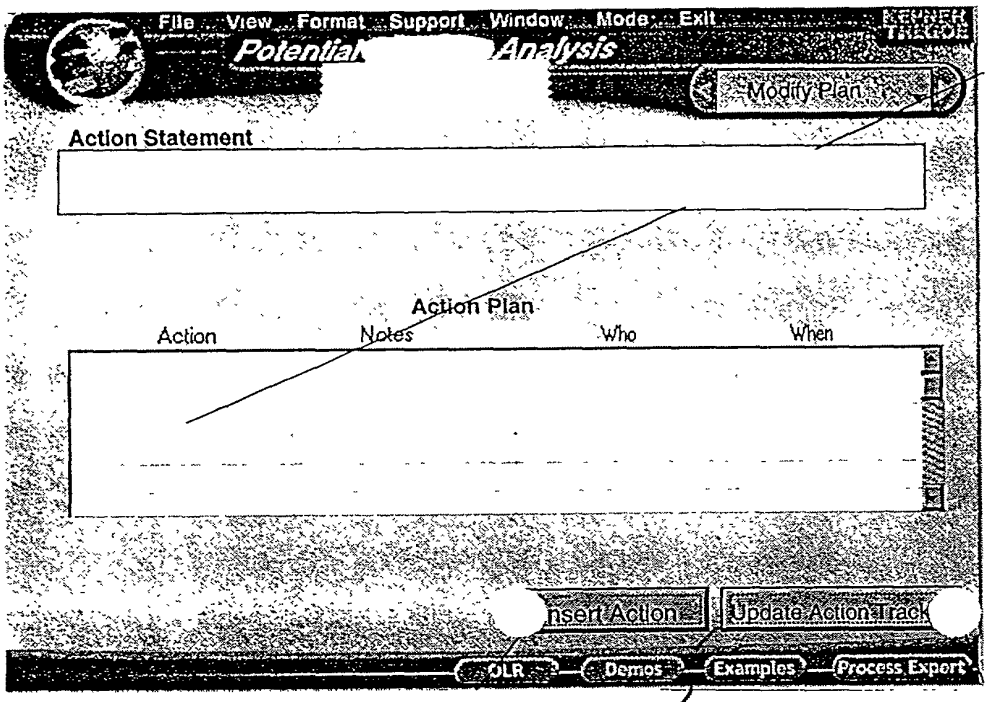


Fig. 53



939 942 940 944 Fig. 54


File View Format Support Window Mode Exit
Potential Analysis
Modify Plan
Action Statement
Action Plan
Action
Notes
Who
When
nsert Action
Update Action Track
OLR
Demos
Examples
Process Export

946

Fig. 55

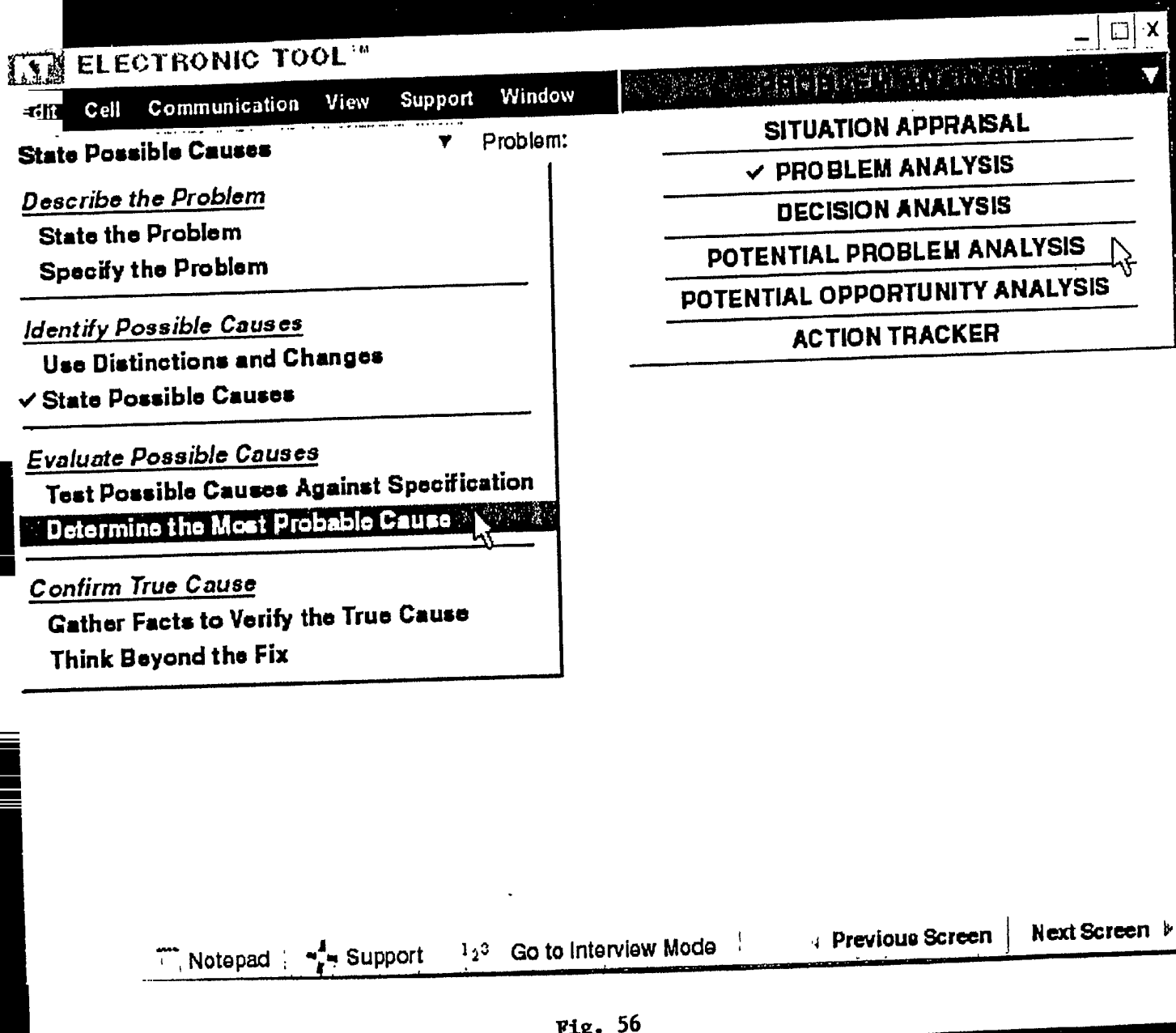

ELECTRONIC TOOL™
Edit
Cell
Communication
View
Support
Window
State Possible Causes
Problem:
Describe the Problem
State the Problem
Specify the Problem
Identify Possible Causes
Use Distinctions and Changes
✓ State Possible Causes
Evaluate Possible Causes
Test Possible Causes Against Specification
Determine the Most Probable Cause
Confirm True Cause
Gather Facts to Verify the True Cause
Think Beyond the Fix
SITUATION APPRAISAL
✓ PROBLEM ANALYSIS
DECISION ANALYSIS
POTENTIAL PROBLEM ANALYSIS
POTENTIAL OPPORTUNITY ANALYSIS
ACTION TRACKER
Notepad
Support
Go to Interview Mode
Previous Screen
Next Screen

Fig. 56

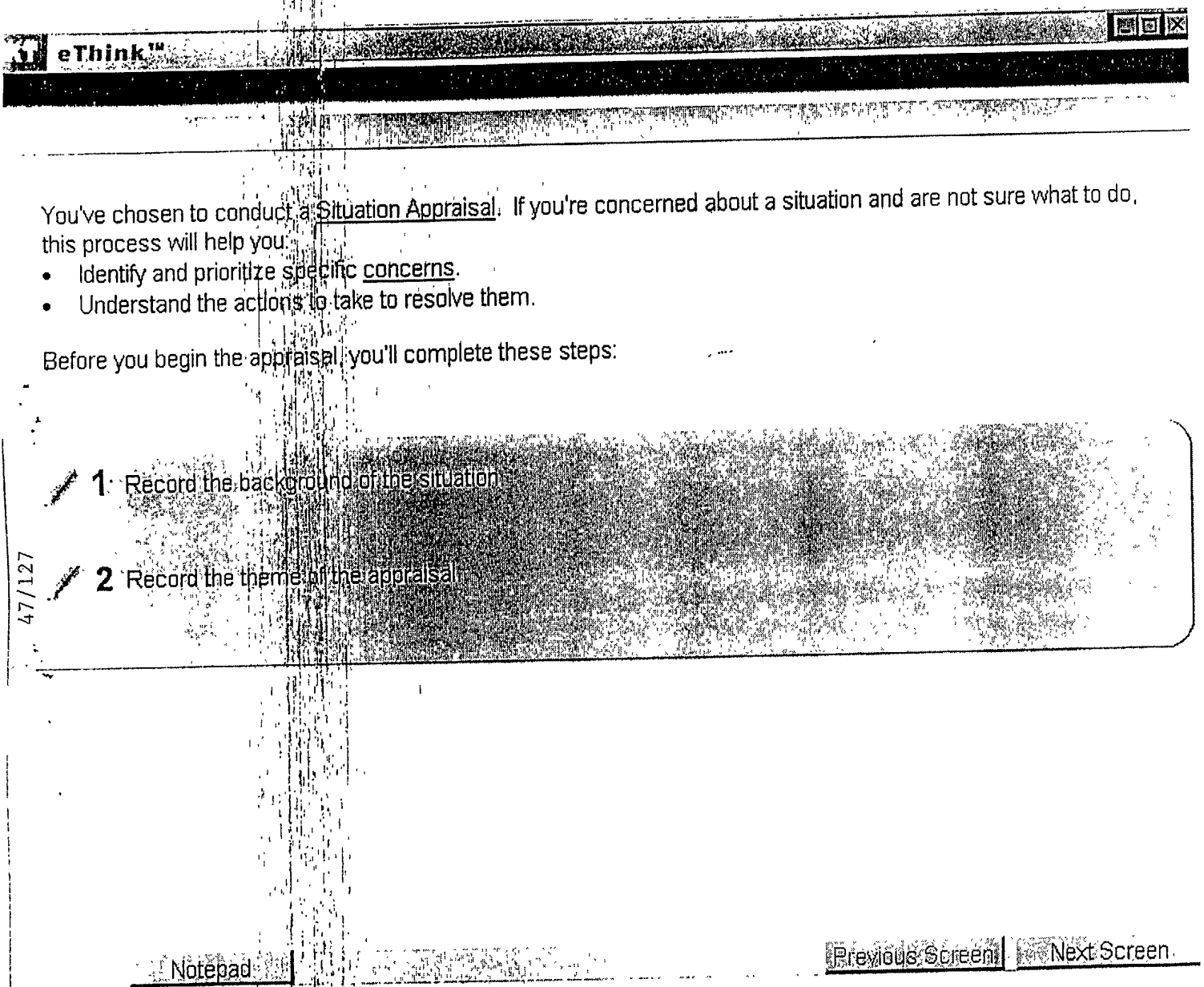


Fig. 57

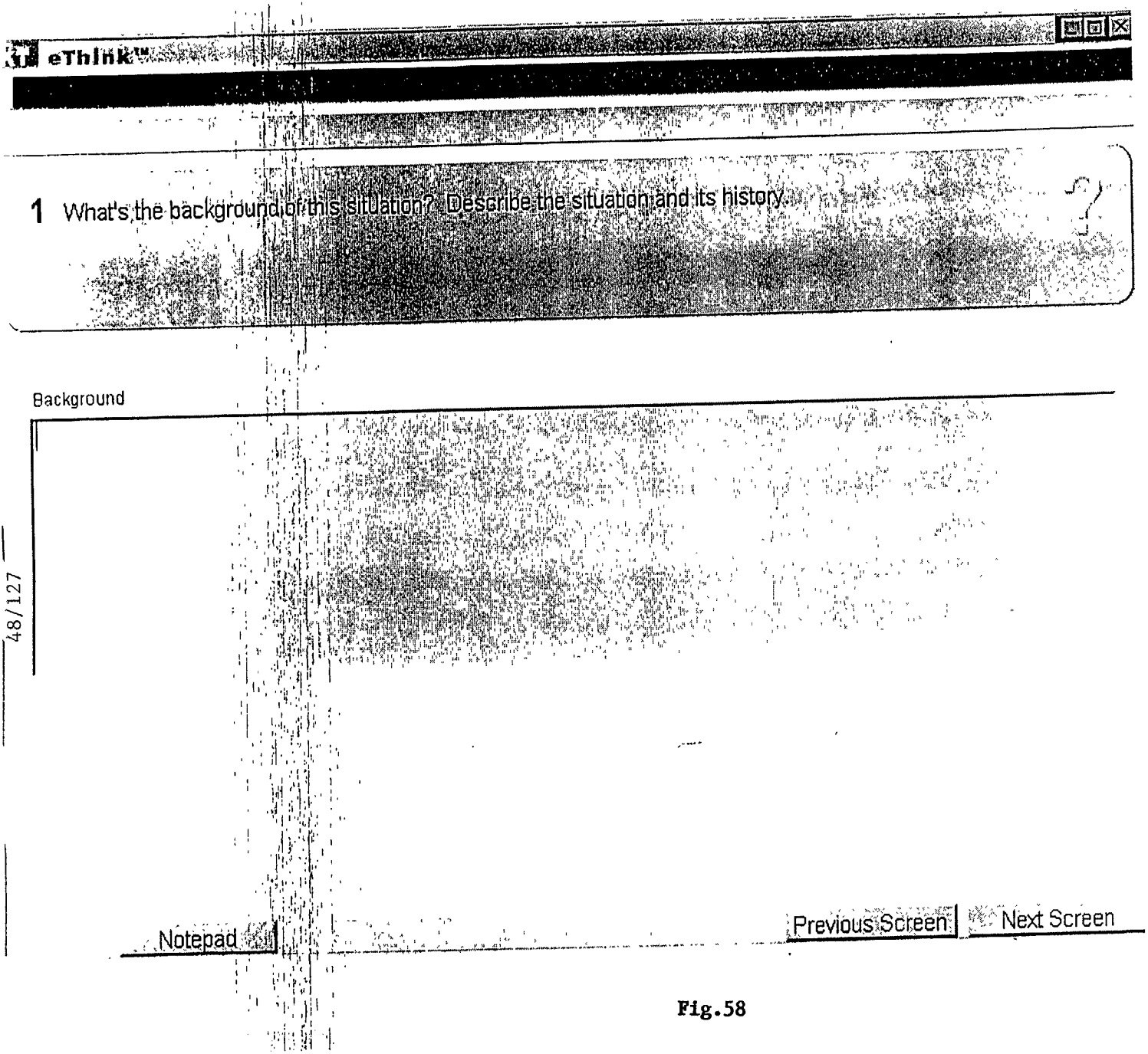


Fig.58

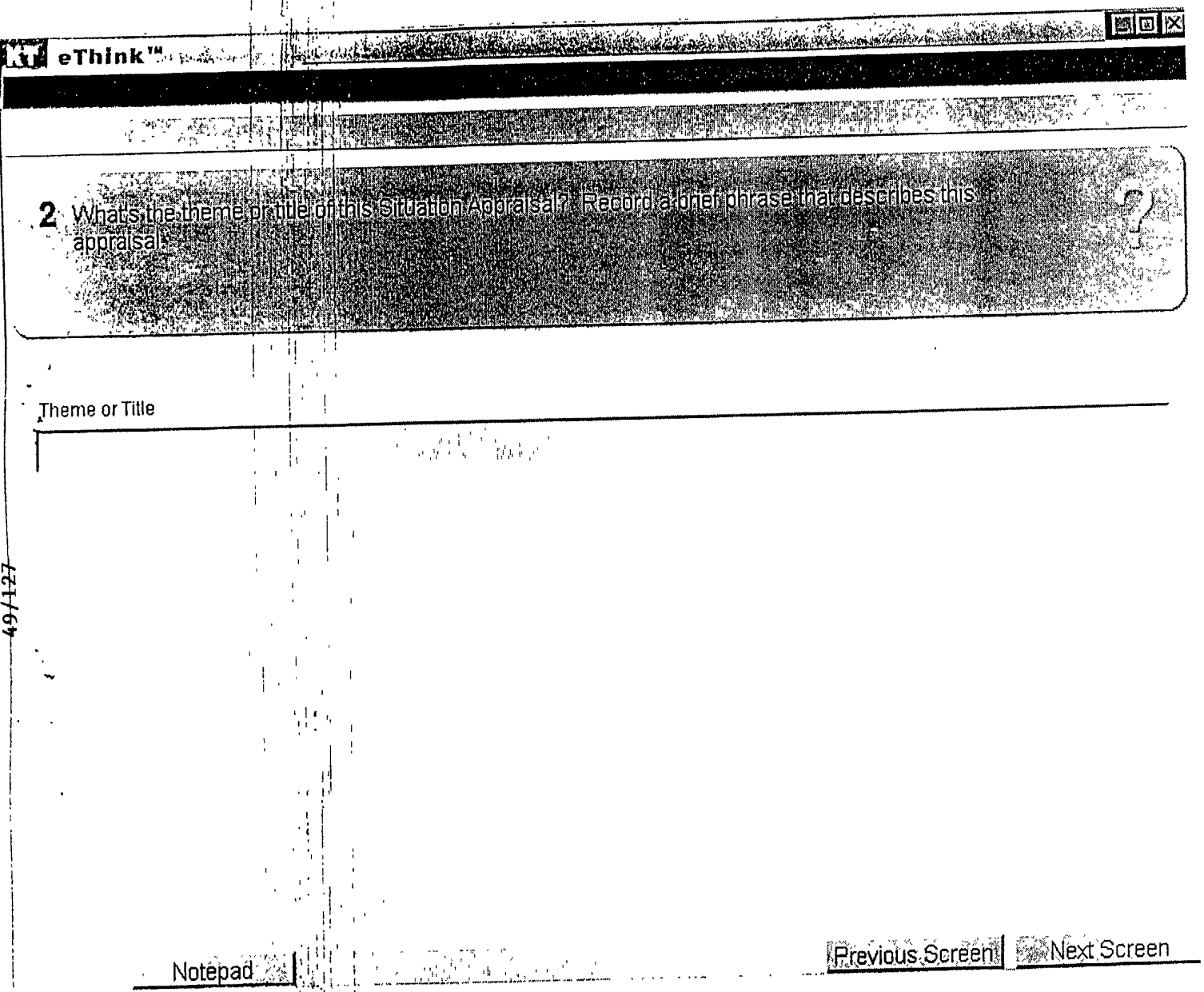

eThink™
2 What's the theme or title of this Situation Appraisal? Record a brief phrase that describes this appraisal.
Theme or Title
Notepad
Previous Screen
Next Screen

Fig. 59

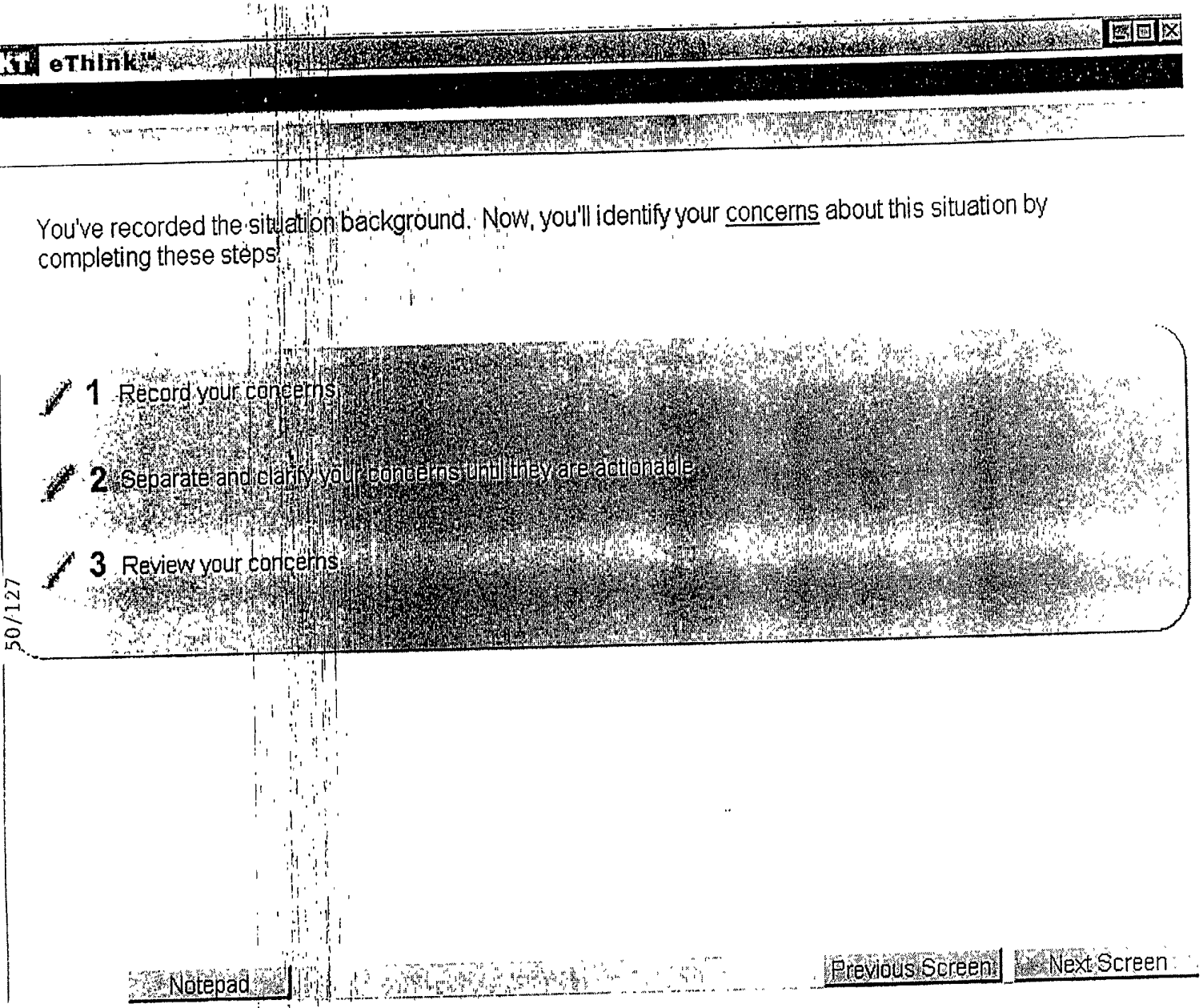


Fig. 60

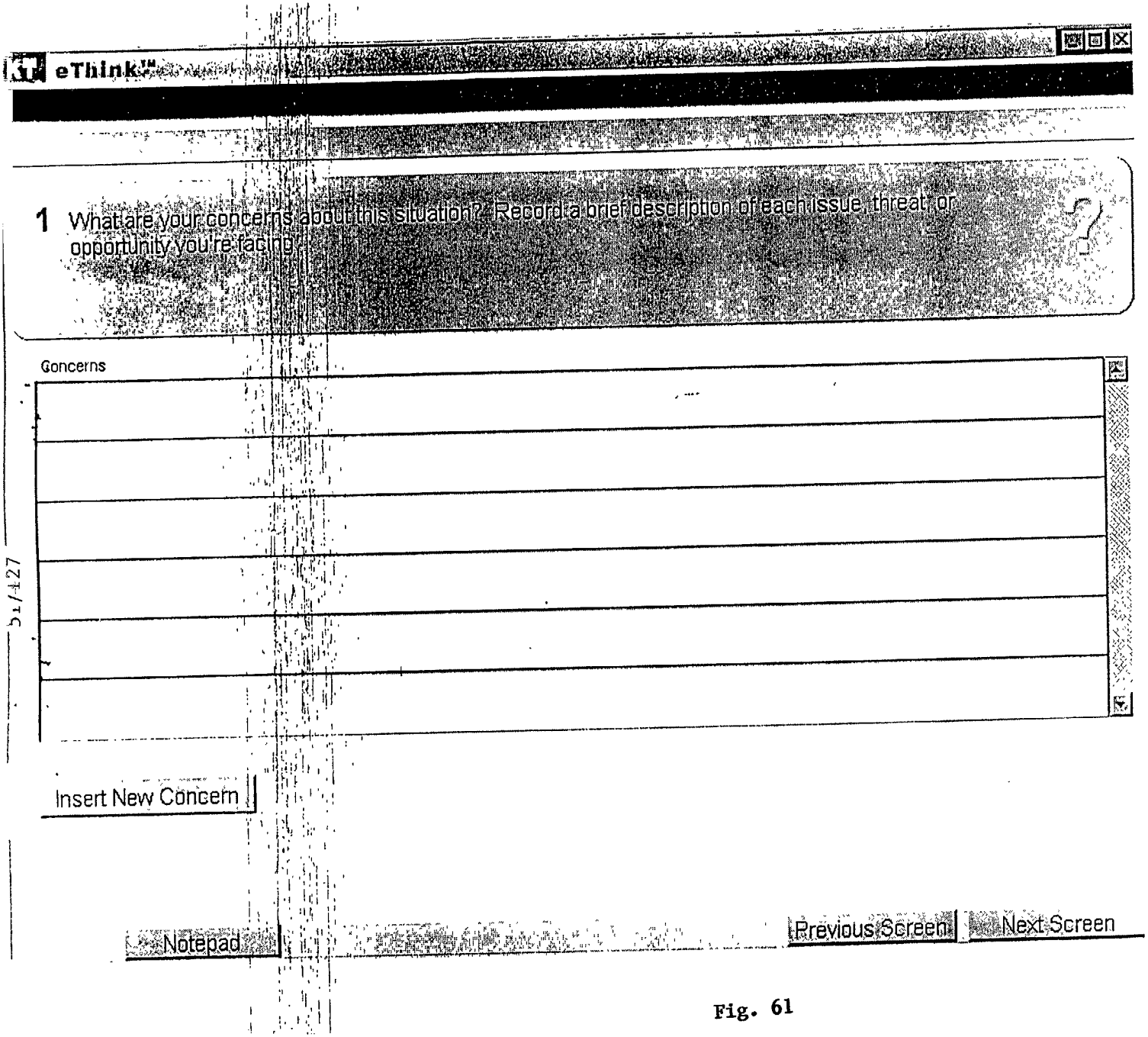

eThink™
1 What are your concerns about this situation? Record a brief description of each issue, threat, or opportunity you're facing.
Concerns
Insert New Concern
Notepad
Previous Screen
Next Screen

Fig. 61

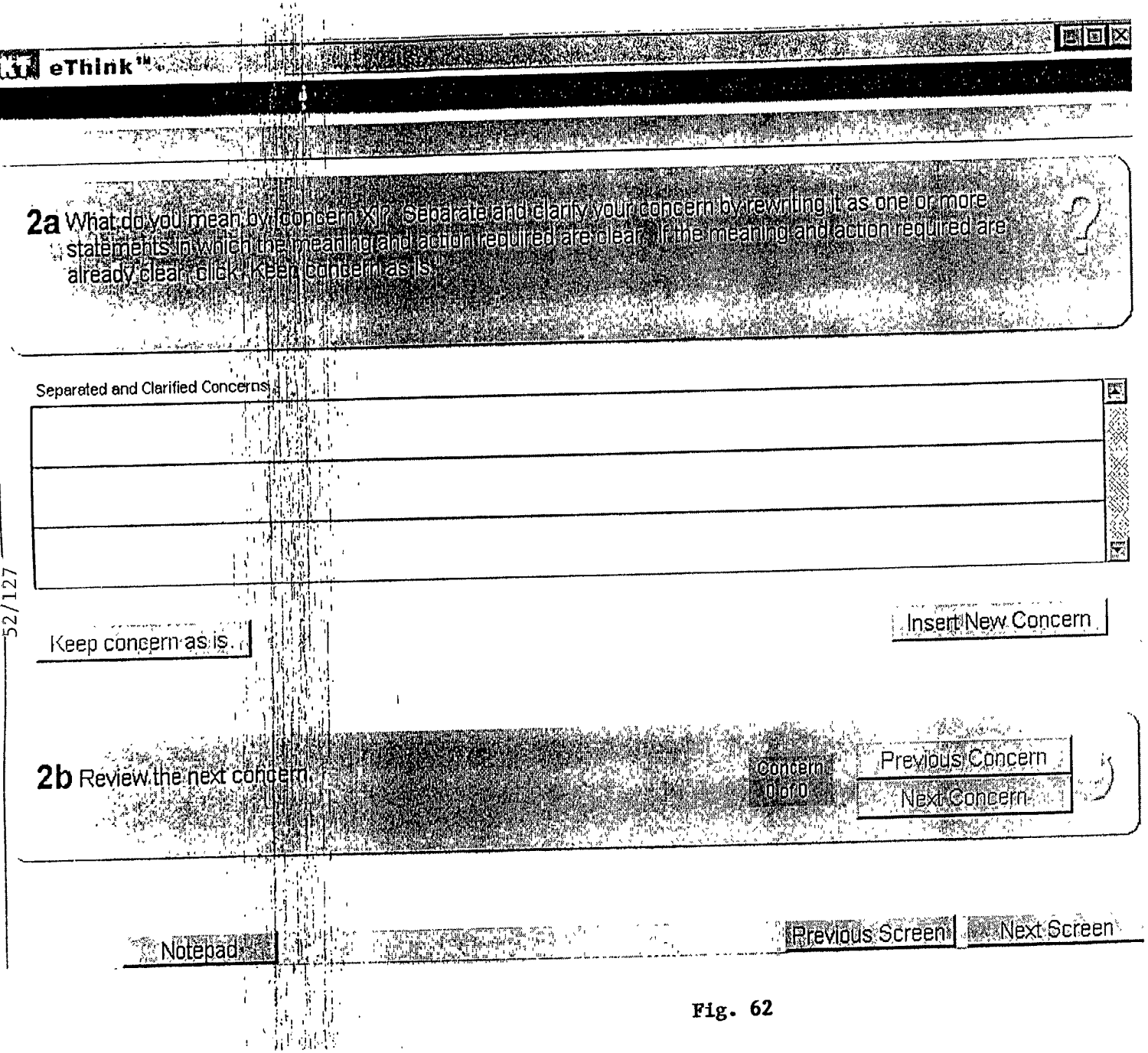


Fig. 62

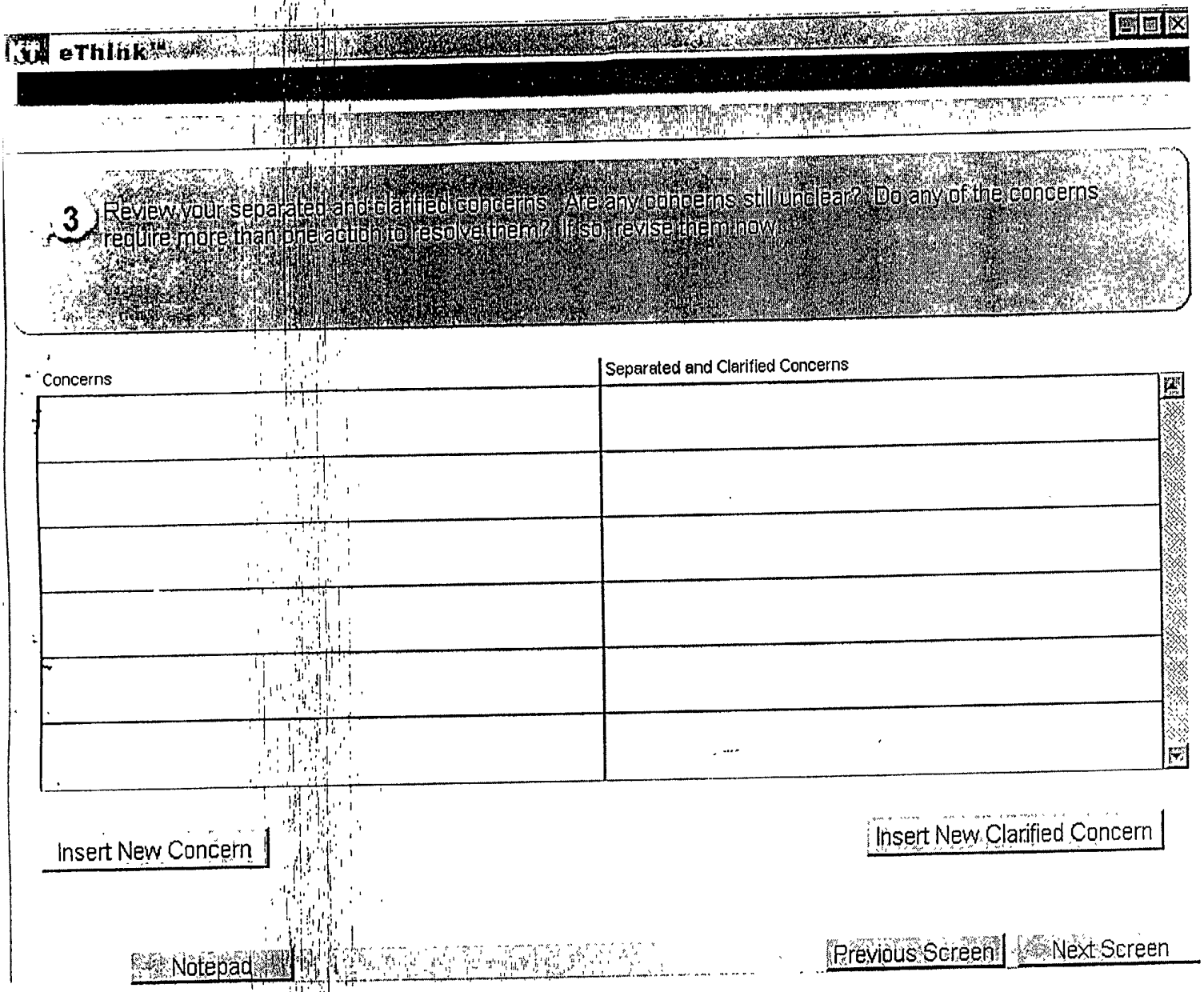

eThink
3 Review your separated and clarified concerns. Are any concerns still unclear? Do any of the concerns require more than one action to resolve them? If so, revise them now.
Concerns
Separated and Clarified Concerns
Insert New Concern
Insert New Clarified Concern
Notepad
Previous Screen
Next Screen

Fig. 63

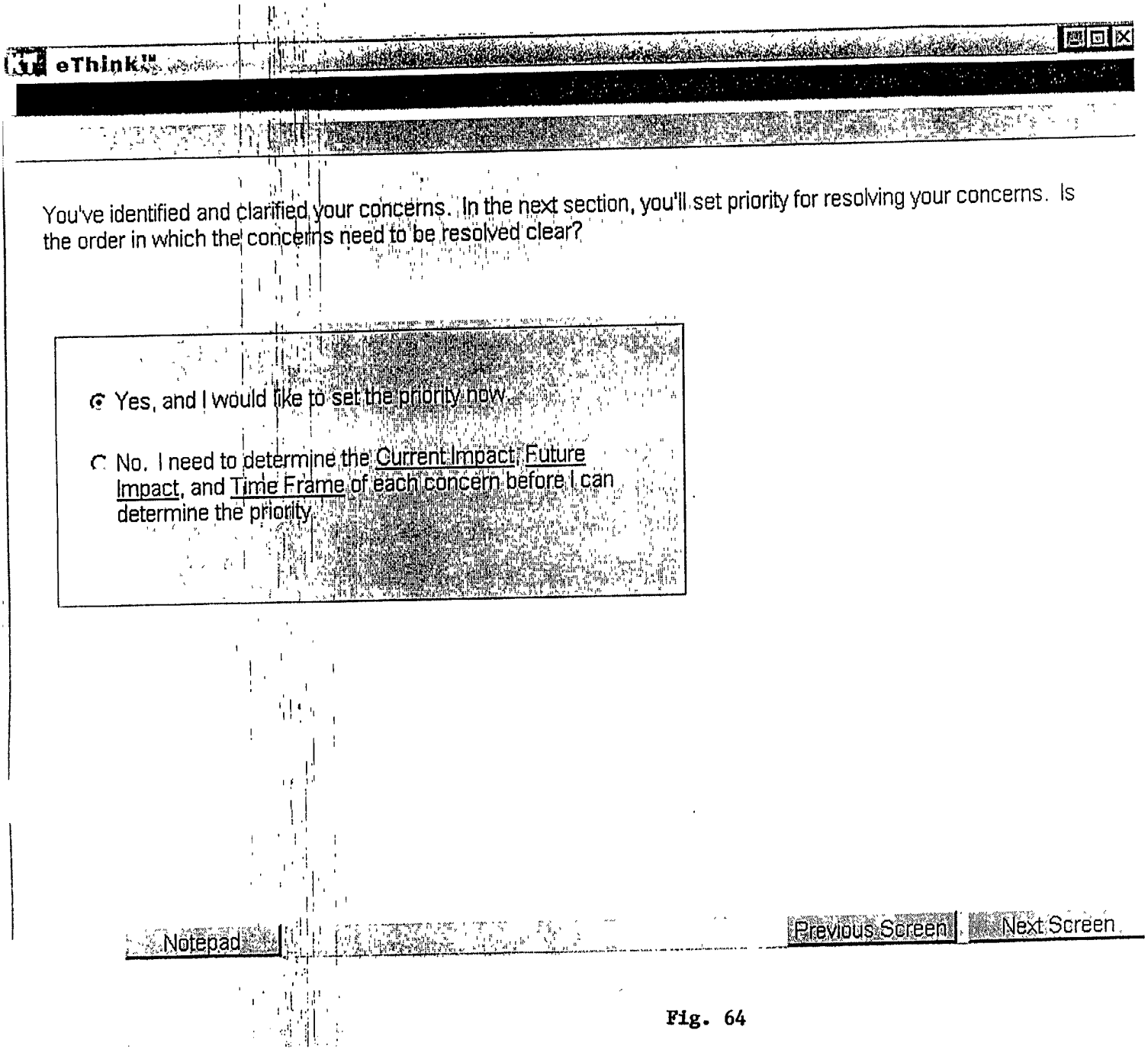

eThink!
You've identified and clarified your concerns. In the next section, you'll set priority for resolving your concerns. Is the order in which the concerns need to be resolved clear?
Yes, and I would like to set the priority now.
No. I need to determine the Current Impact, Future Impact, and Time Frame of each concern before I can determine the priority.
Notepad
Previous Screen
Next Screen

Fig. 64

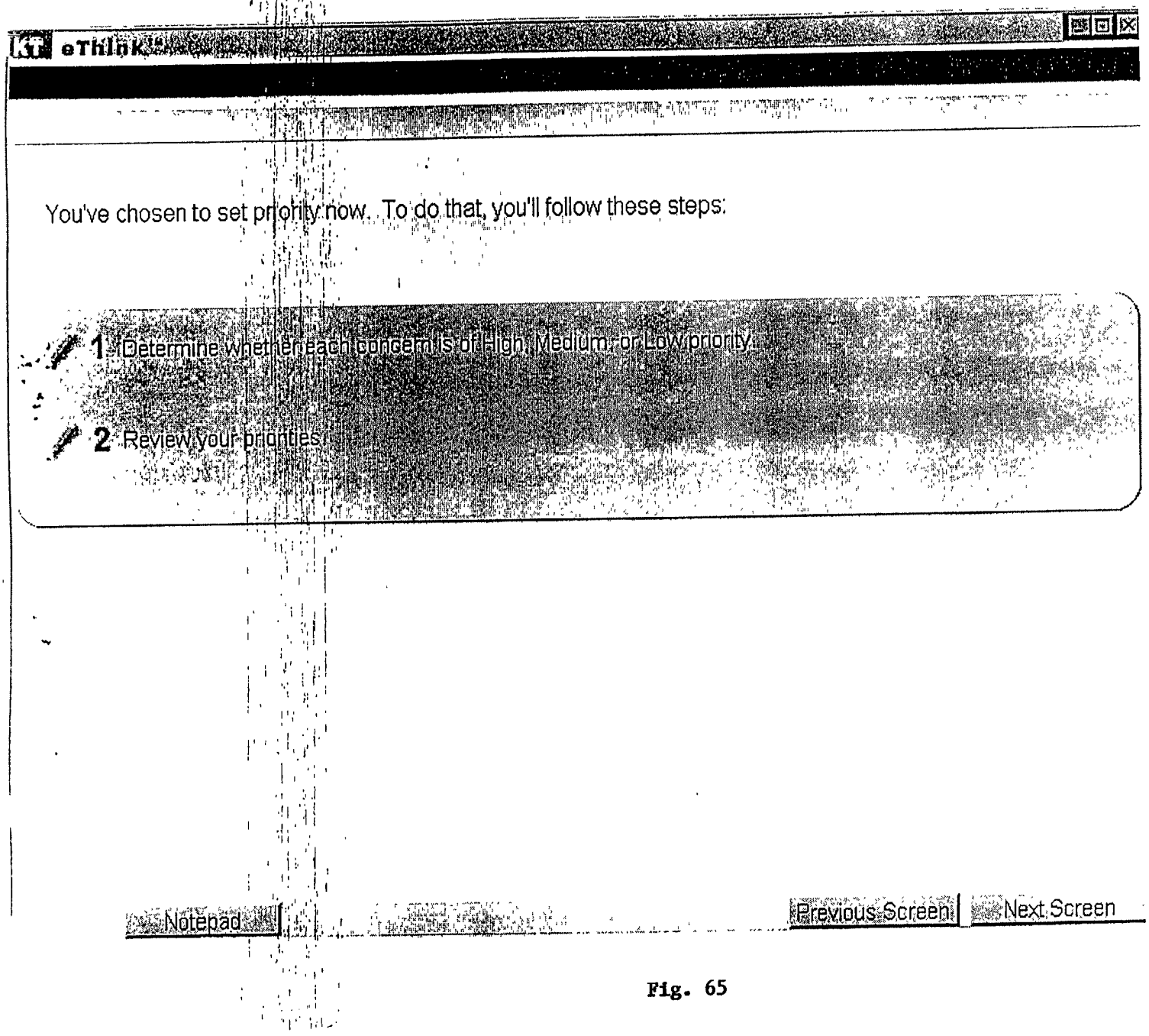

eThink
You've chosen to set priority now. To do that, you'll follow these steps:
1 Determine whether each concern is of High, Medium, or Low priority.
2 Review your priorities.
Notepad
Previous Screen
Next Screen

Fig. 65

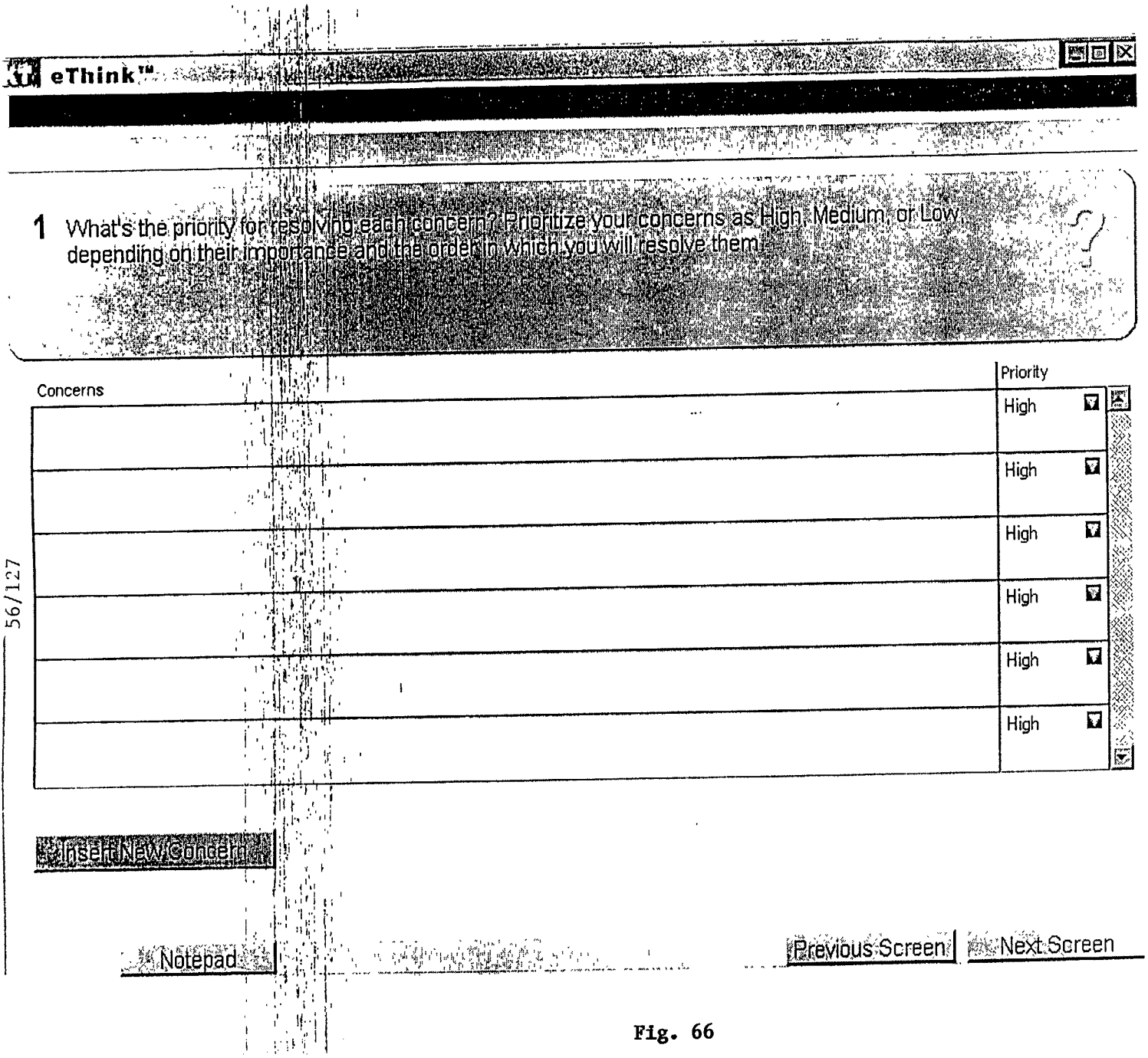

eThink™
1 What's the priority for resolving each concern? Prioritize your concerns as High, Medium, or Low depending on their importance and the order in which you will resolve them.
Concerns
Priority
High
High
High
High
High
High
Insert New Concern
Notepad
Previous Screen
Next Screen

Fig. 66

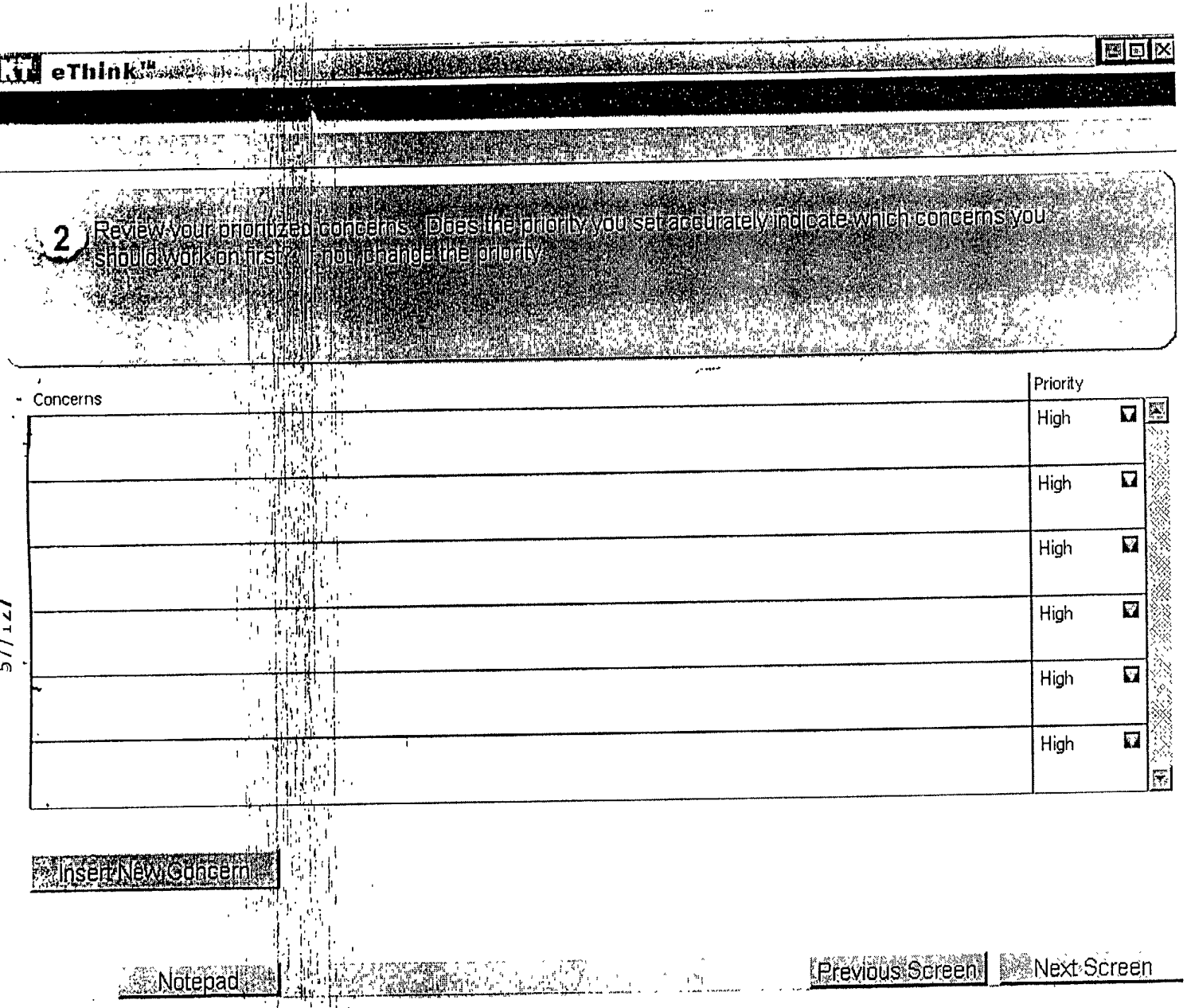


Fig. 67

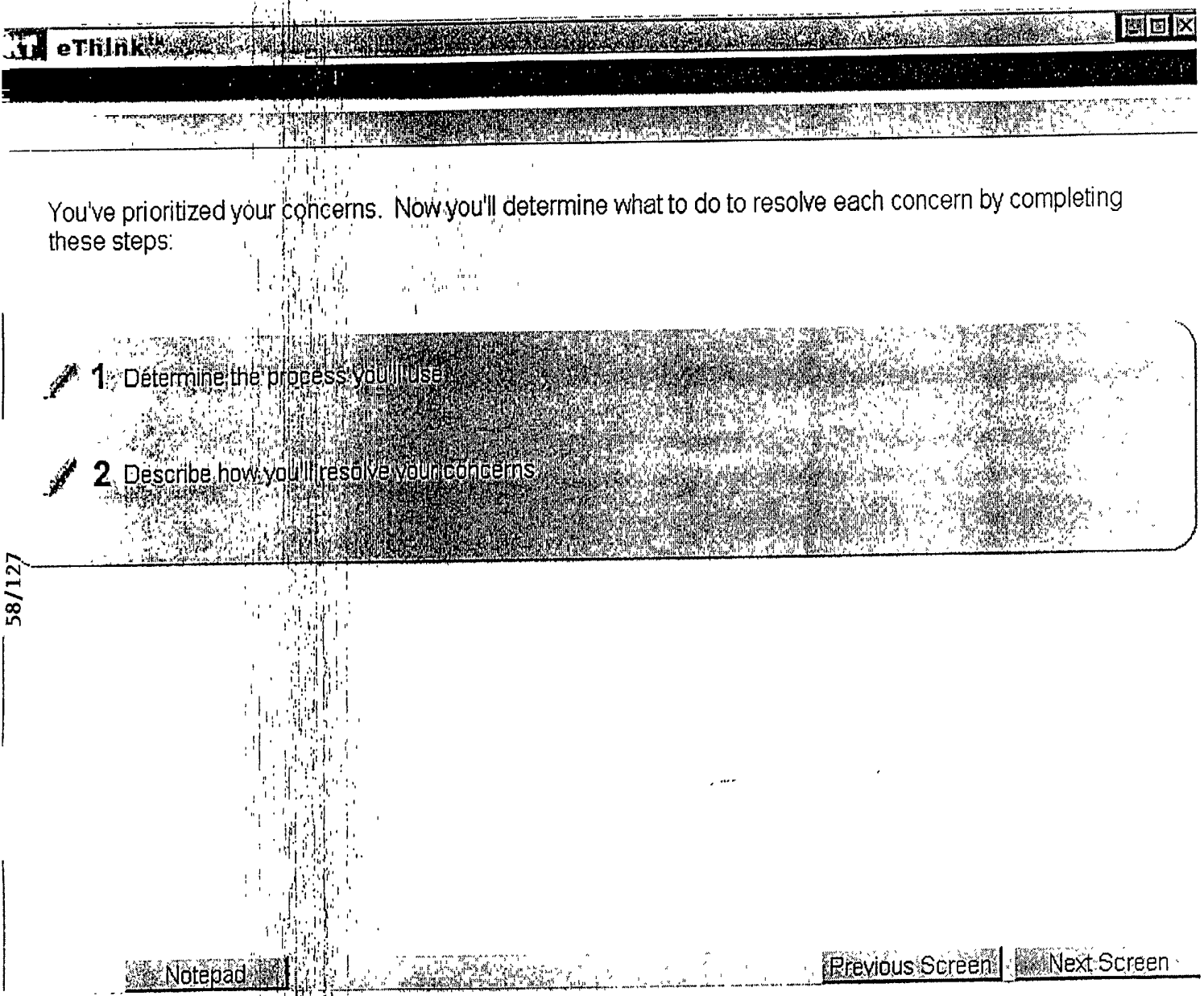


Fig. 68

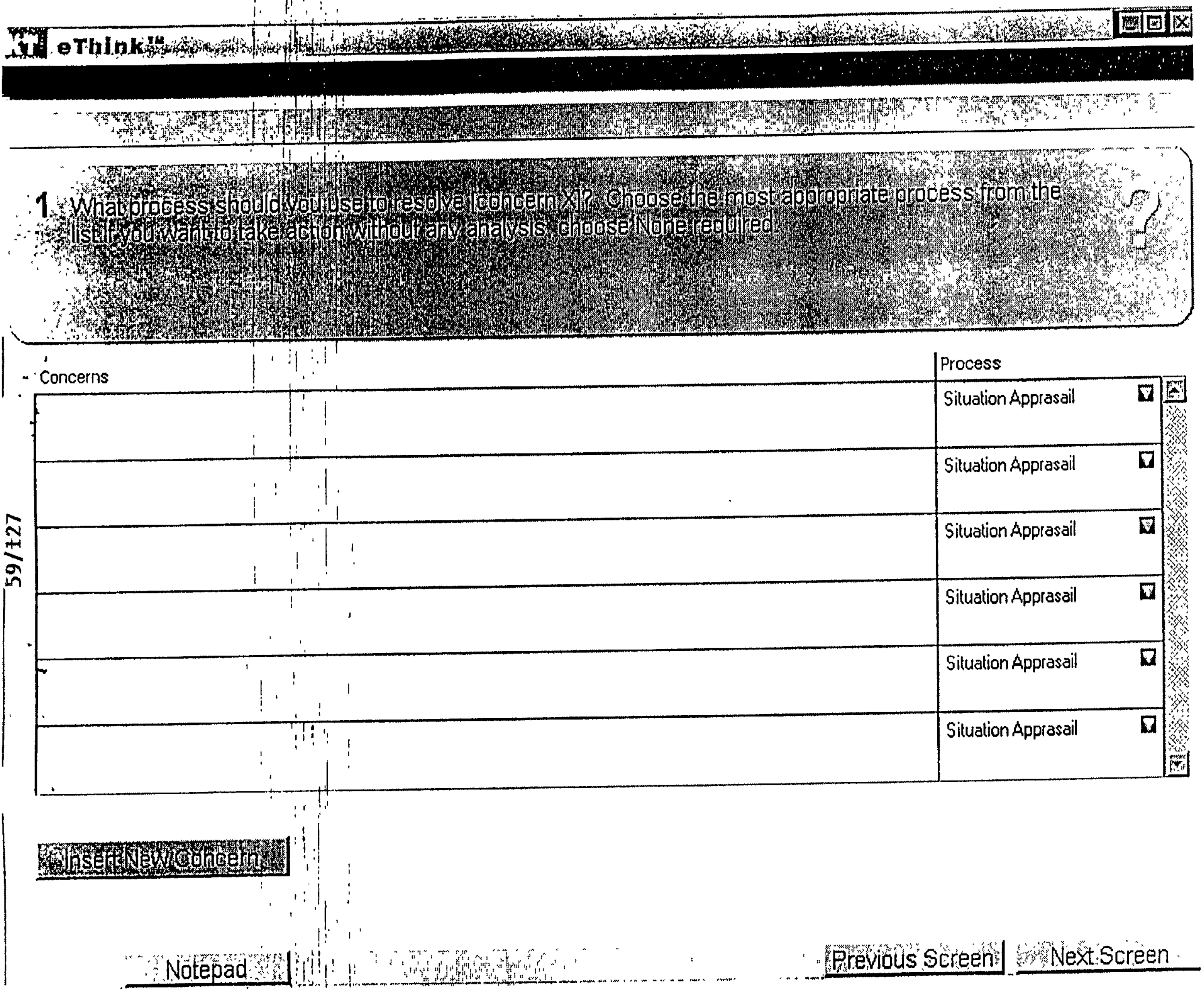

eThink™
1 What process should you use to resolve [concern X]? Choose the most appropriate process from the list. If you want to take action without any analysis, choose None required.
Concerns
Process
Situation Apprasail
Situation Apprasail
Situation Apprasail
Situation Apprasail
Situation Apprasail
Situation Apprasail
Insert New Concern
Notepad
Previous Screen
Next Screen

Fig. 69

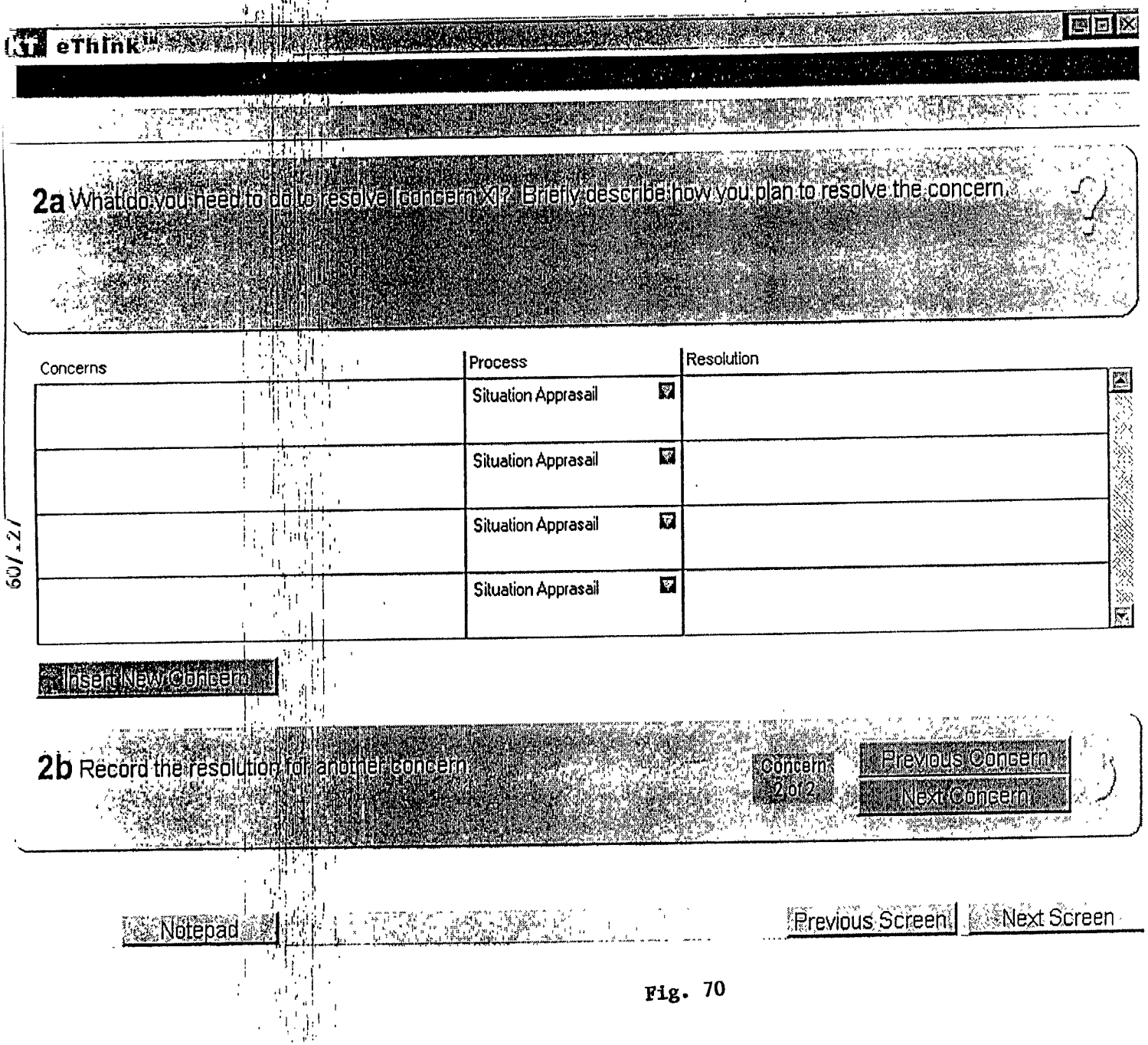


Fig. 70

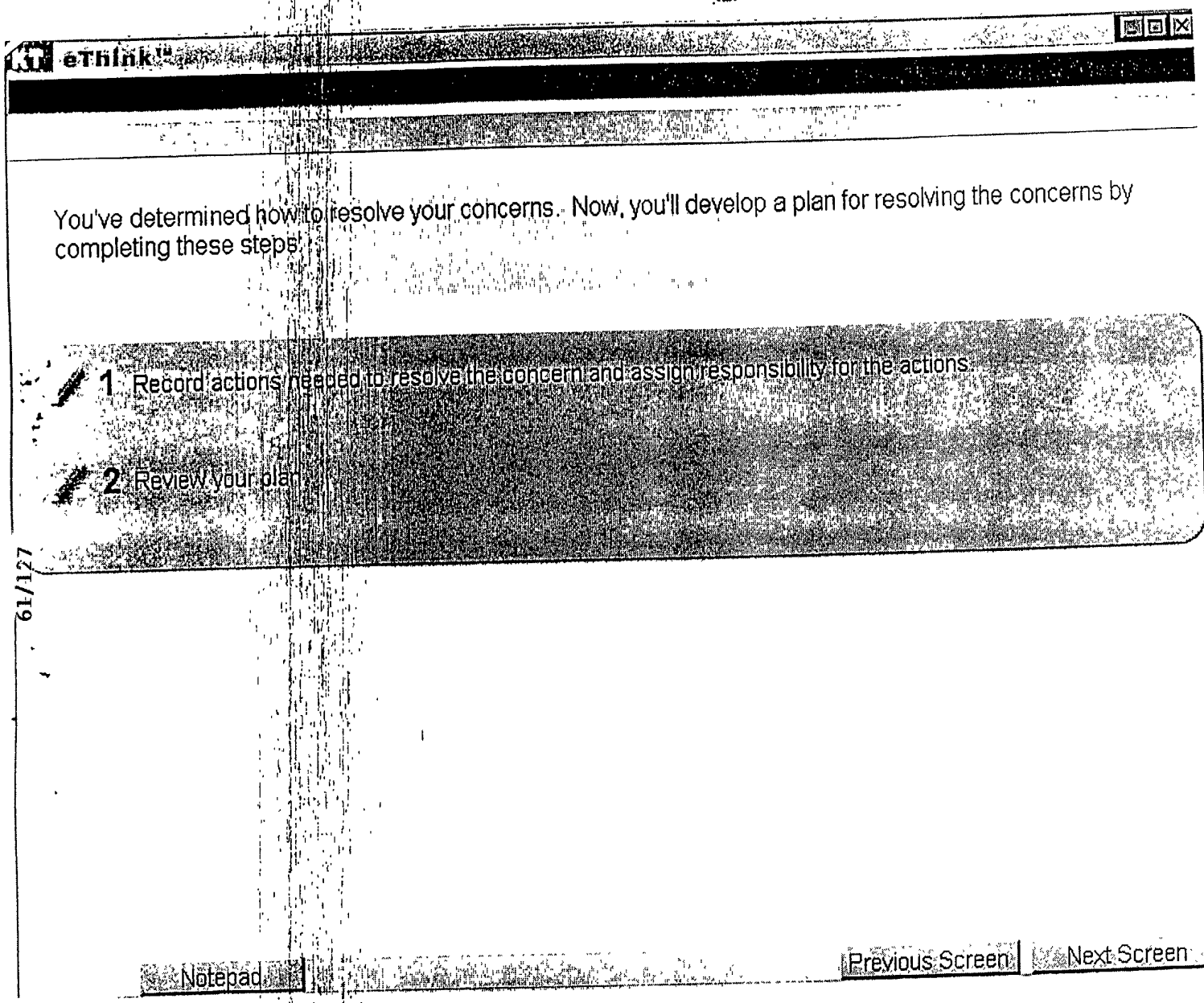

eThink™
You've determined how to resolve your concerns. Now, you'll develop a plan for resolving the concerns by completing these steps:
1 Record actions needed to resolve the concern and assign responsibility for the actions.
2 Review your plan.
Notepad
Previous Screen
Next Screen

Fig. 71

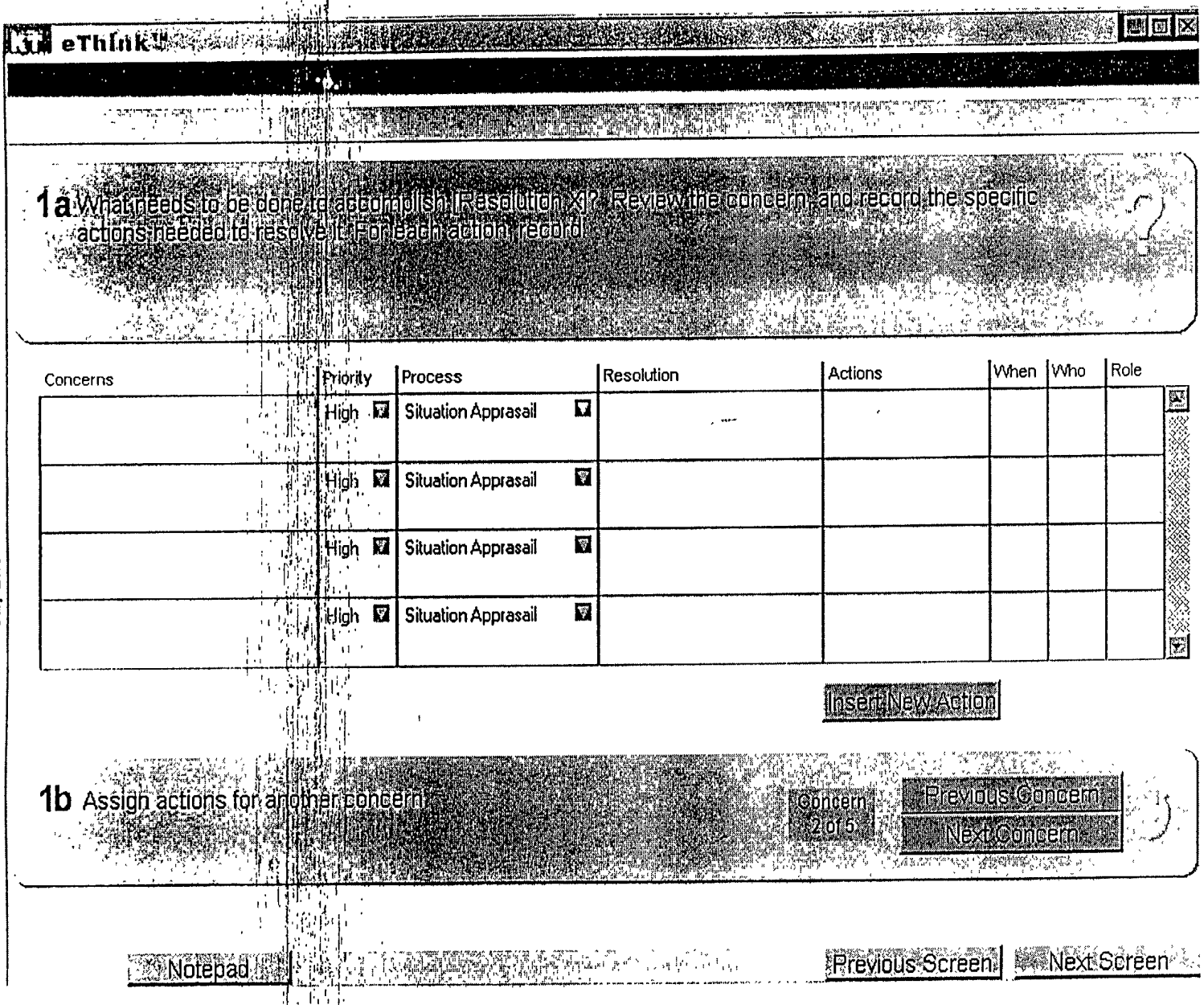


Fig. 72

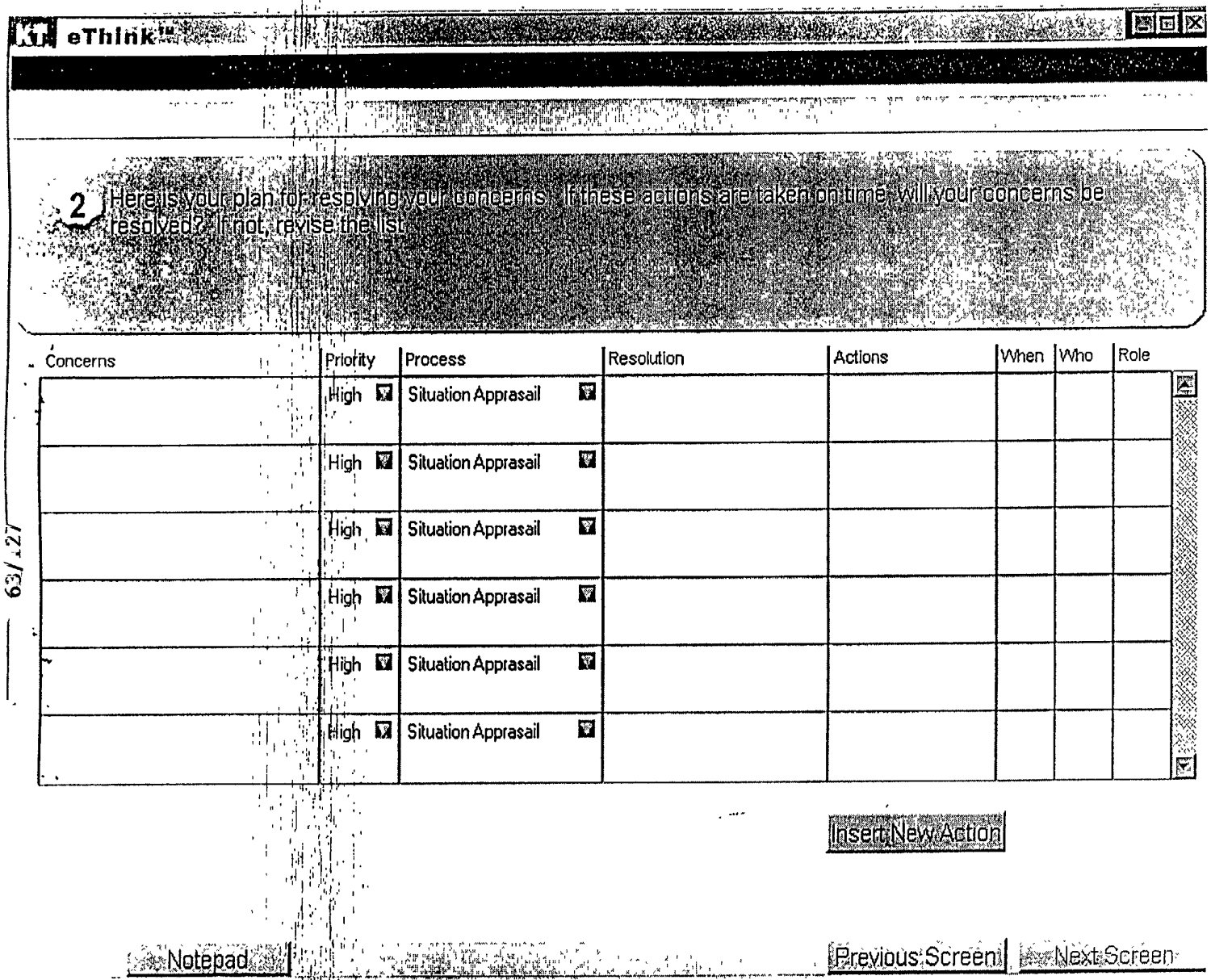


Fig. 73

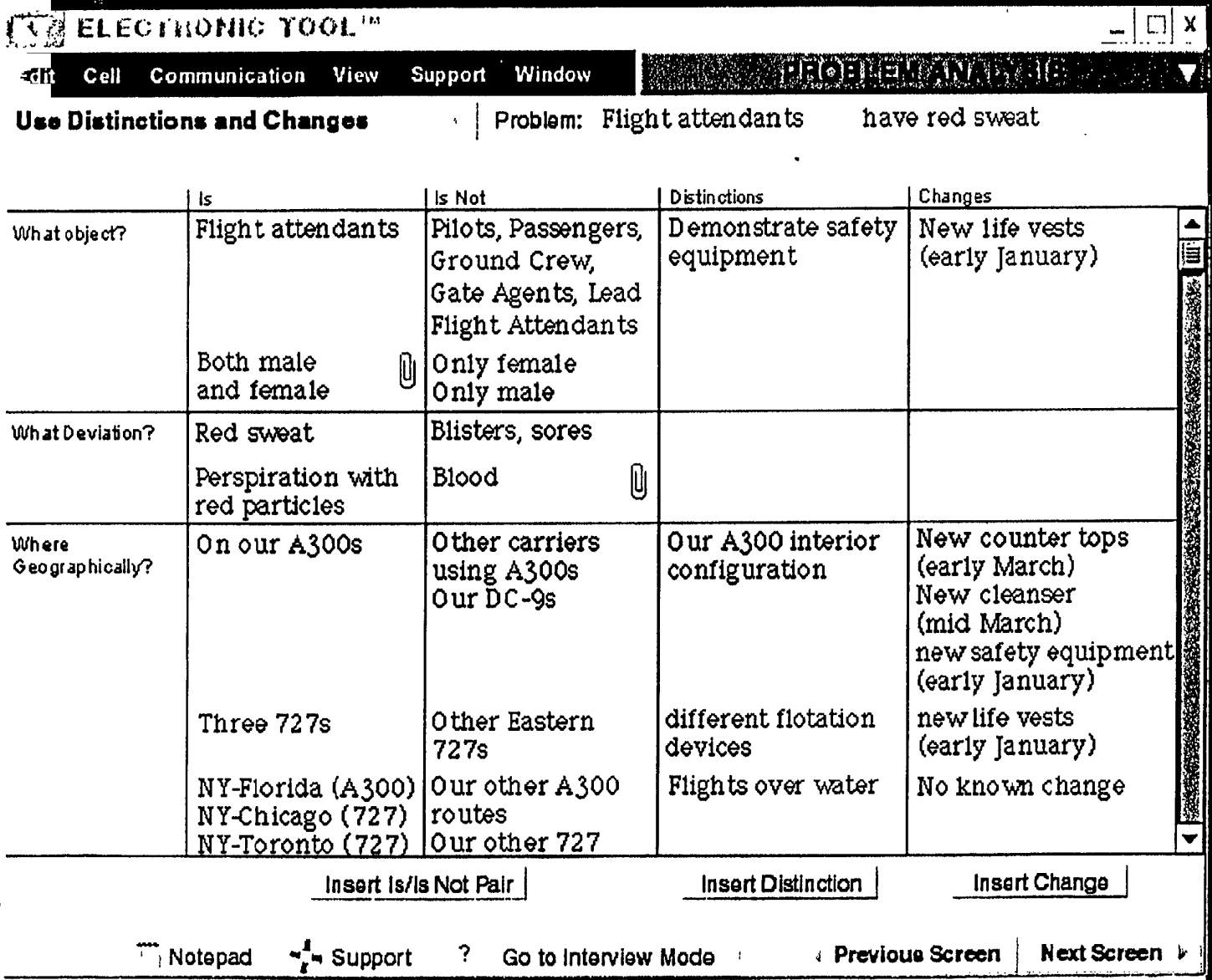


Fig. 74

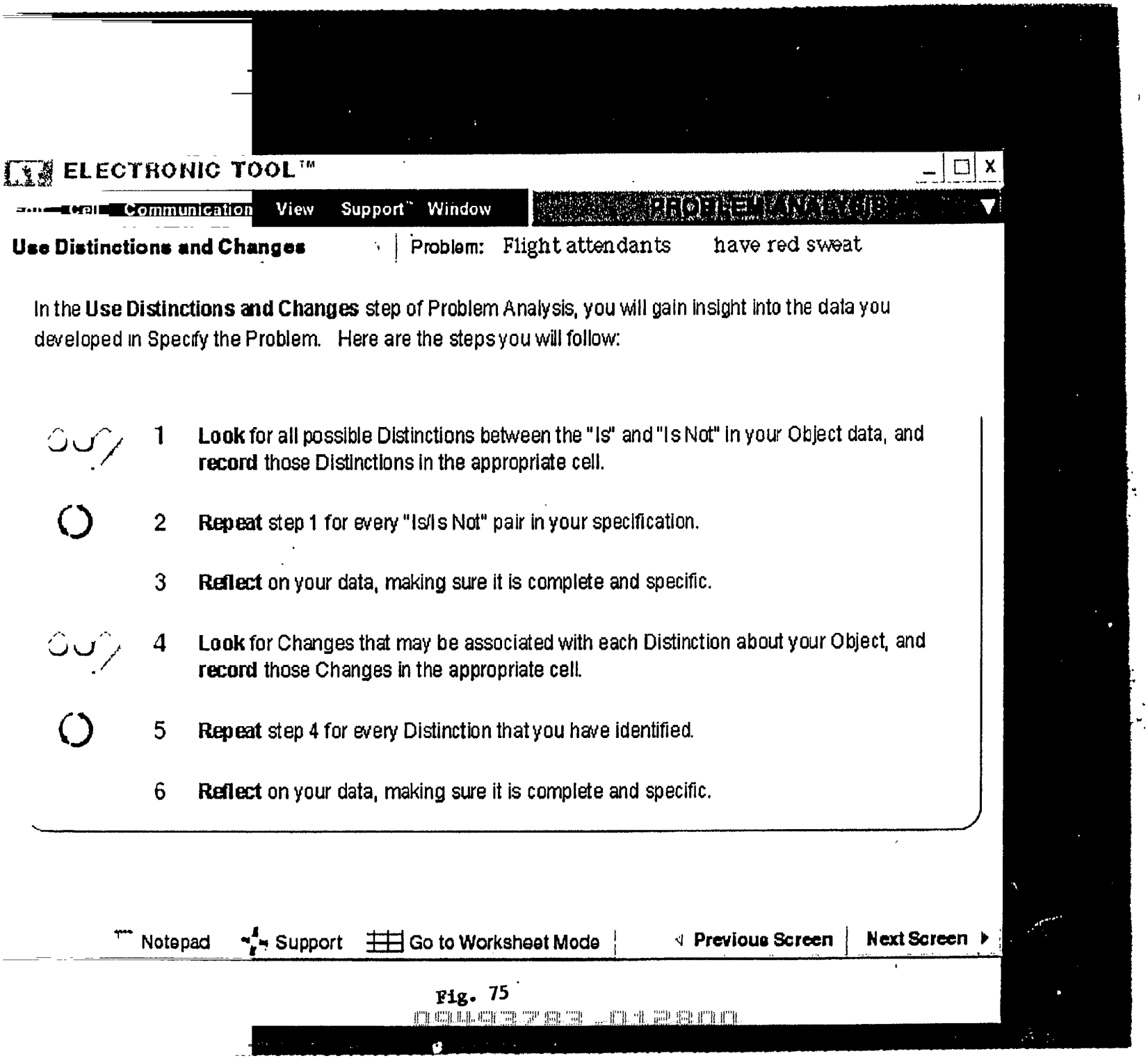

ELECTRONIC TOOL™
Communication
View
Support
Window
PROBLEM ANALYSIS
Use Distinctions and Changes
Problem: Flight attendants have red sweat
In the Use Distinctions and Changes step of Problem Analysis, you will gain insight into the data you developed in Specify the Problem. Here are the steps you will follow:
1 Look for all possible Distinctions between the "Is" and "Is Not" in your Object data, and record those Distinctions in the appropriate cell.
2 Repeat step 1 for every "Is/Is Not" pair in your specification.
3 Reflect on your data, making sure it is complete and specific.
4 Look for Changes that may be associated with each Distinction about your Object, and record those Changes in the appropriate cell.
5 Repeat step 4 for every Distinction that you have identified.
6 Reflect on your data, making sure it is complete and specific.
Notepad
Support
Go to Worksheet Mode
Previous Screen
Next Screen

Fig. 75

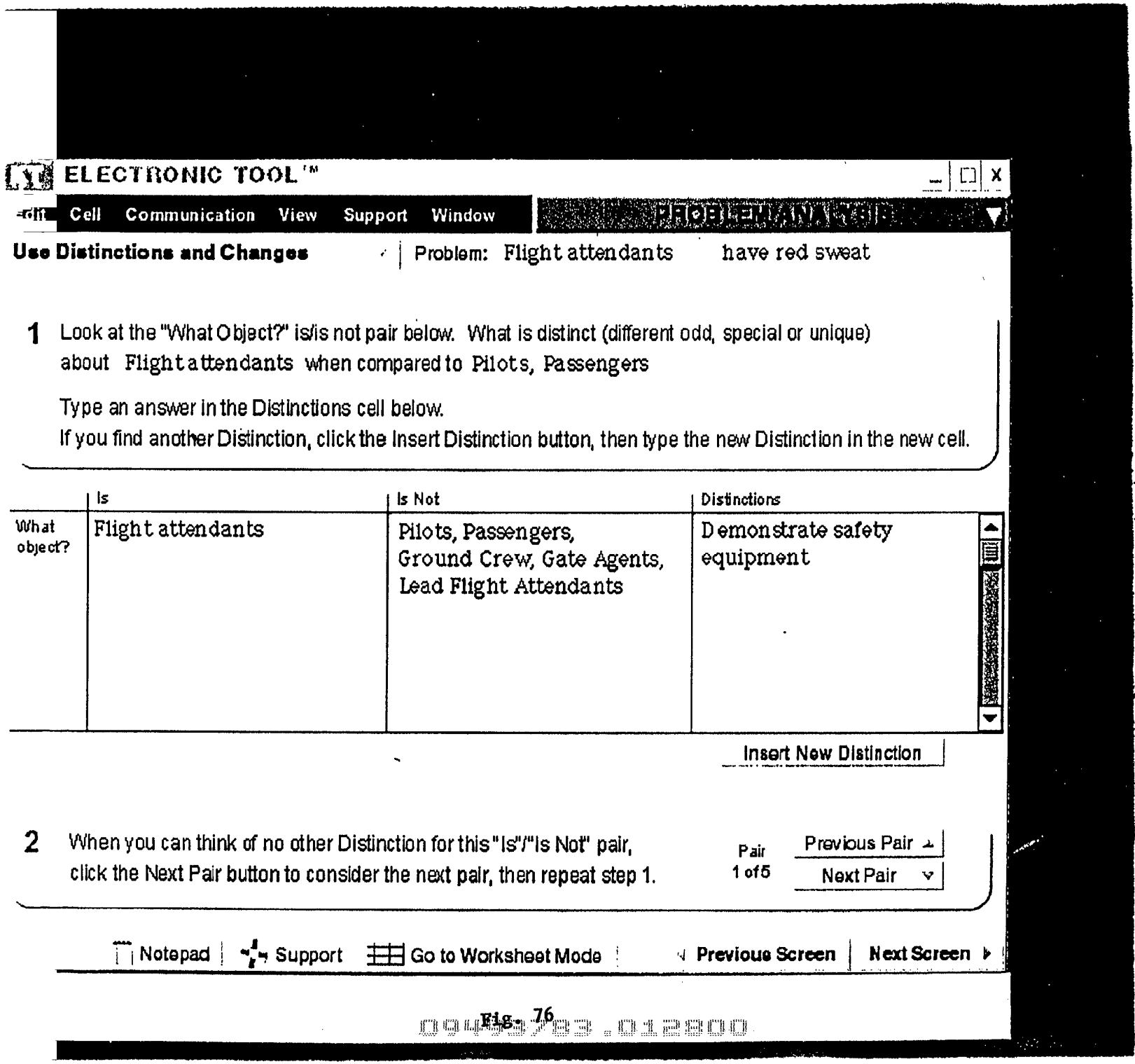

ELECTRONIC TOOL™
Cell
Communication
View
Support
Window
Use Distinctions and Changes
Problem: Flight attendants have red sweat
1 Look at the "What Object?" is/is not pair below. What is distinct (different odd, special or unique) about Flight attendants when compared to Pilots, Passengers
Type an answer in the Distinctions cell below.
If you find another Distinction, click the Insert Distinction button, then type the new Distinction in the new cell.
Is
Is Not
Distinctions
What object?
Flight attendants
Pilots, Passengers, Ground Crew, Gate Agents, Lead Flight Attendants
Demonstrate safety equipment
Insert New Distinction
2 When you can think of no other Distinction for this "Is"/"Is Not" pair, click the Next Pair button to consider the next pair, then repeat step 1.
Pair 1 of 5
Previous Pair
Next Pair
Notepad
Support
Go to Worksheet Mode
Previous Screen
Next Screen

Fig. 76

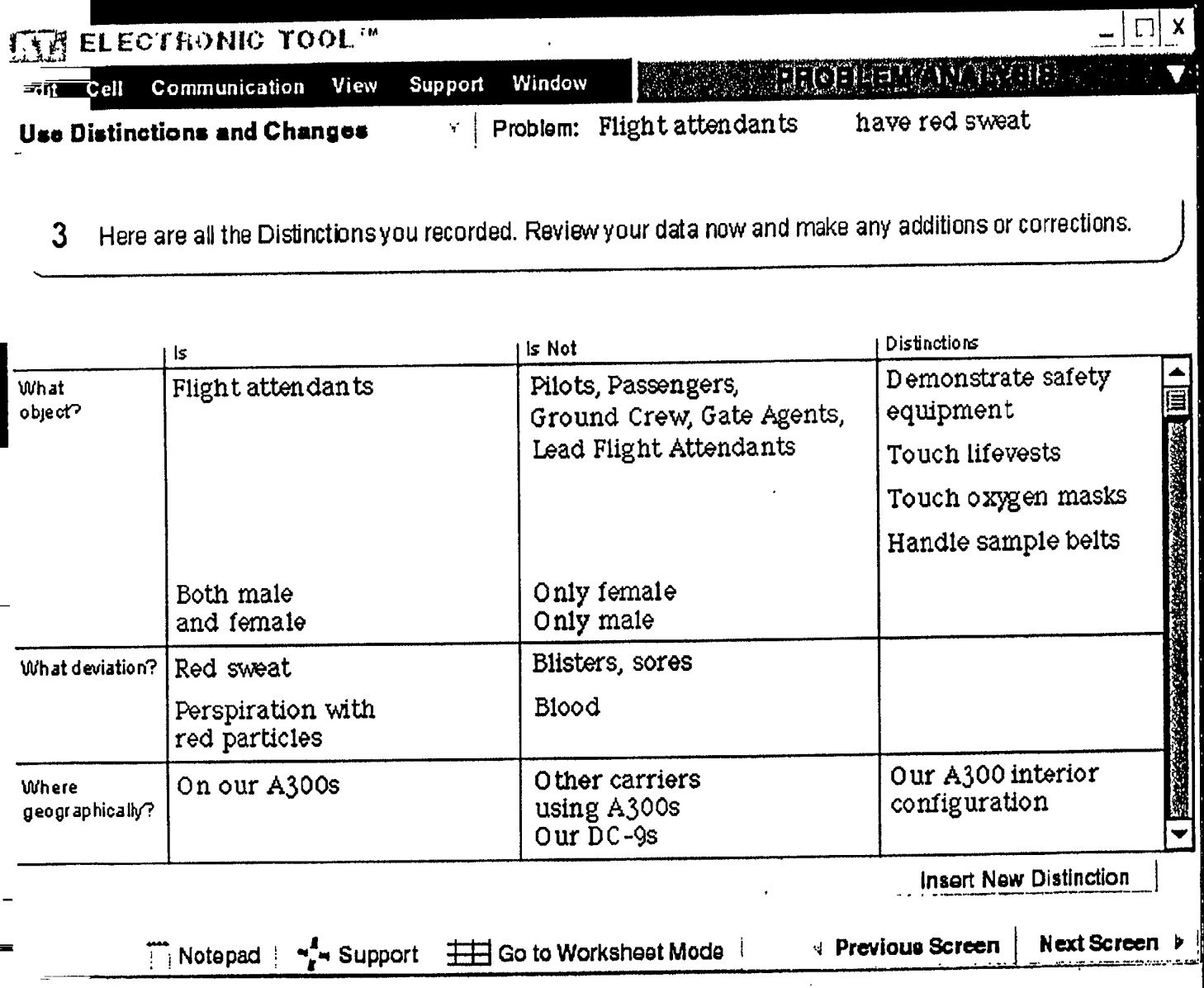

ELECTRONIC TOOL™
Cell Communication View Support Window
PROBLEM ANALYSIS
Use Distinctions and Changes
Problem: Flight attendants have red sweat
3 Here are all the Distinctions you recorded. Review your data now and make any additions or corrections.
Is
Is Not
Distinctions
What object?
Flight attendants
Pilots, Passengers, Ground Crew, Gate Agents, Lead Flight Attendants
Demonstrate safety equipment
Touch lifevests
Touch oxygen masks
Handle sample belts
Both male and female
Only female
Only male
What deviation?
Red sweat
Perspiration with red particles
Blisters, sores
Blood
Where geographically?
On our A300s
Other carriers using A300s
Our DC-9s
Our A300 interior configuration
Insert New Distinction
Notepad
Support
Go to Worksheet Mode
Previous Screen
Next Screen

Fig. 77

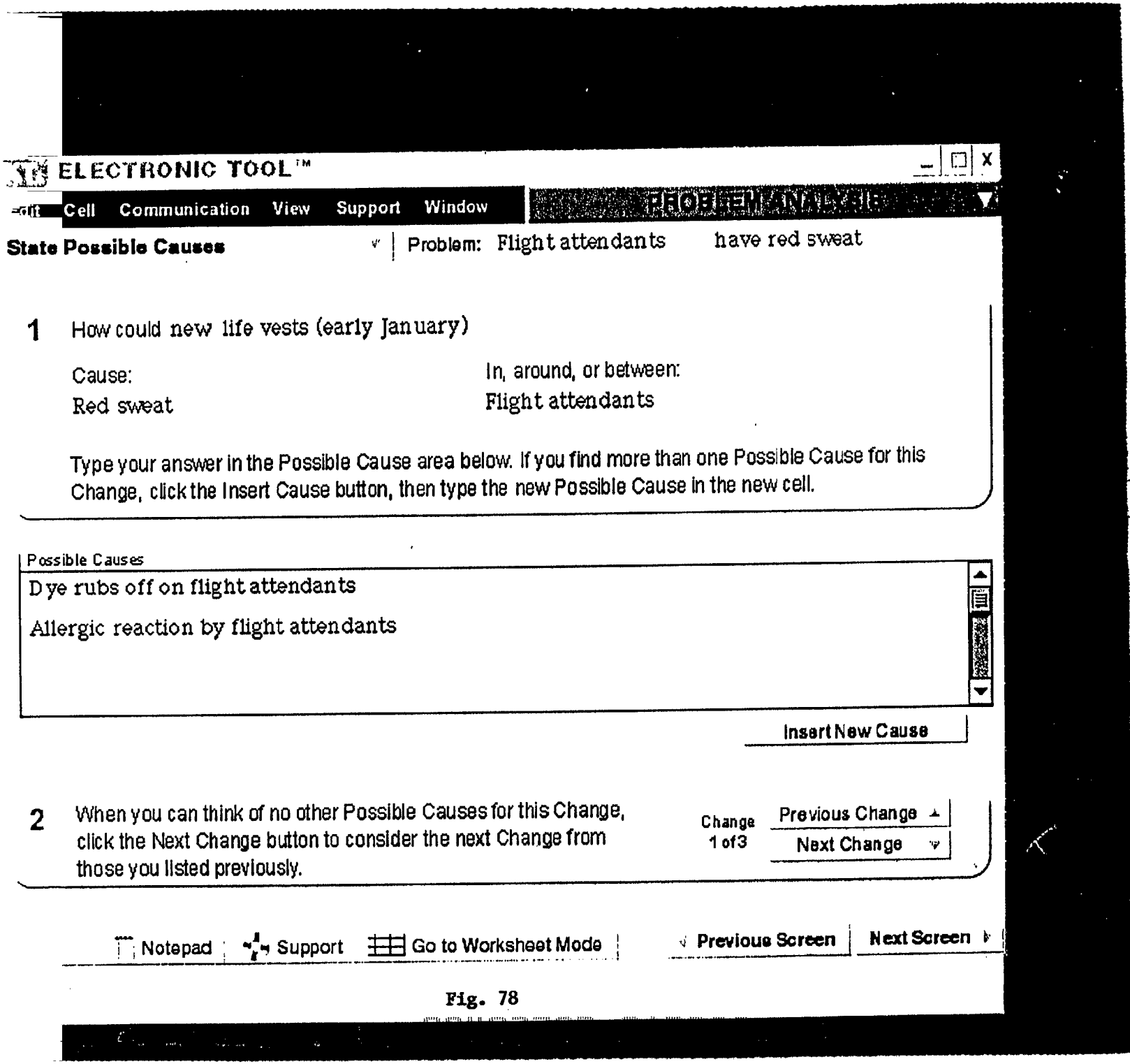

ELECTRONIC TOOL™
Cell
Communication
View
Support
Window
PROBLEM ANALYSIS
State Possible Causes
Problem: Flight attendants have red sweat
1 How could new life vests (early January)
Cause:
Red sweat
In, around, or between:
Flight attendants
Type your answer in the Possible Cause area below. If you find more than one Possible Cause for this Change, click the Insert Cause button, then type the new Possible Cause in the new cell.
Possible Causes
Dye rubs off on flight attendants
Allergic reaction by flight attendants
Insert New Cause
2 When you can think of no other Possible Causes for this Change, click the Next Change button to consider the next Change from those you listed previously.
Change 1 of 3
Previous Change
Next Change
Notepad
Support
Go to Worksheet Mode
Previous Screen
Next Screen

Fig. 78

ELECTRONIC TOOL™

Cell Communication View Support Window PROBLEM ANALYSIS

Test Possible Causes Against Spec. | Problem: Flight attendants have red sweat

Select a cause to test: Ink from the printed letters causing allergic reactions in some attendants

	Is	Is Not	Conditions	Assumptions or Reasons
What object?	Flight attendants	Pilots, Passengers, Ground Crew, Gate Agents, Lead Flight Attendants	only if...	the flight attendants are the only ones touching lifevests
	Both male and female	Only female Only male	yes, because...	men and women can have allergies
What Deviation?	Red sweat	Blisters, sores	no, because...	allergies cause rash & blisters, not sweat
	Perspiration with red particles	Blood	no, because...	allergies cause rash & blisters, not sweat
Where Geographically?	On our A300s	Other carriers using A300s Our DC-9s	yes, because...	only our A300s use vests with printing
	Three 727s	Other Eastern 727s	yes, because...	only those 727s use vests with printing
	NY-Florida (A300)	Our other A300	yes, because...	only these routes use

Insert Reason or Assumption

Notepad | Support | 1 2 3 Go to Interview Mode | Previous Screen | Next Screen

Fig. 79

09457783.012800

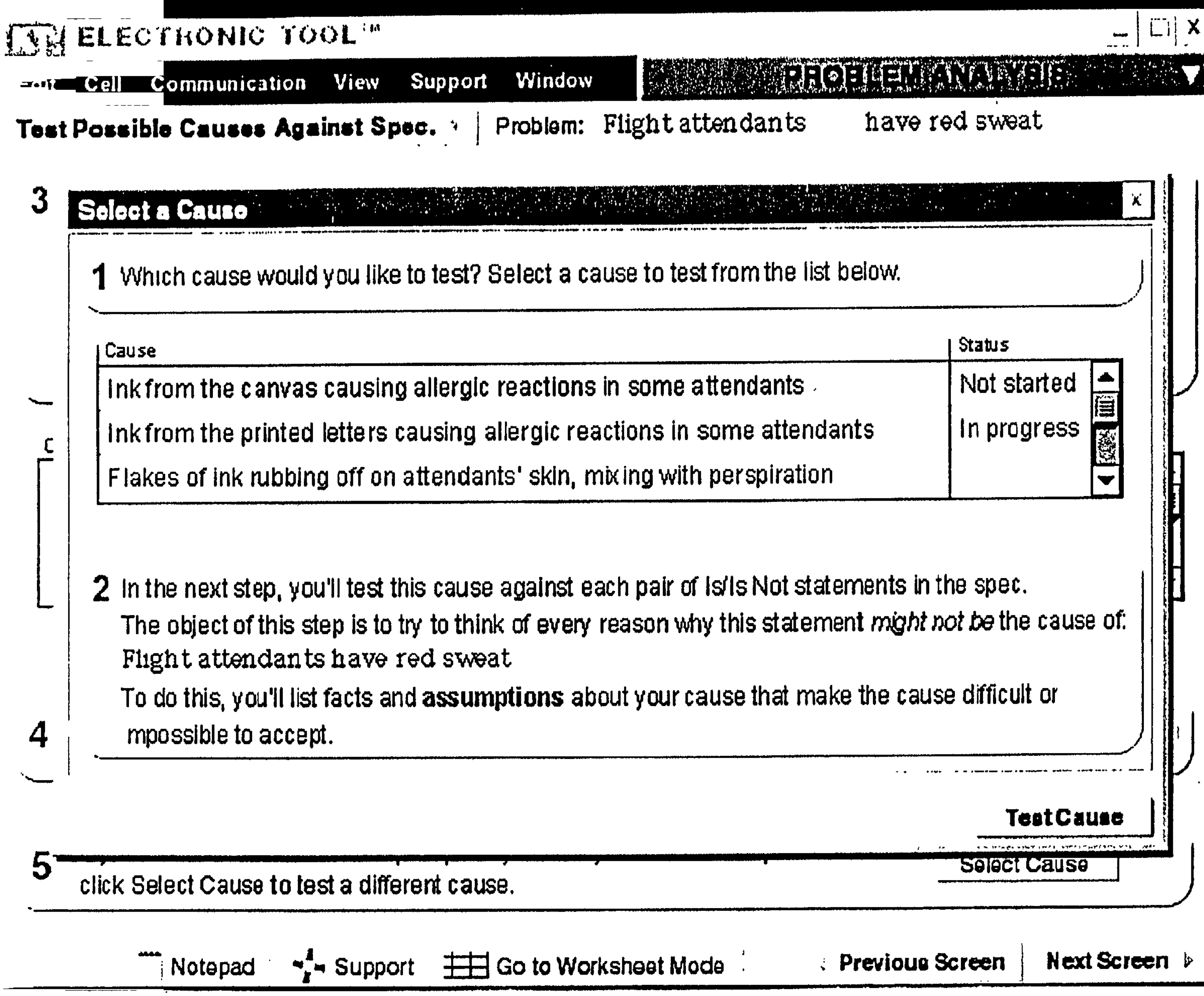


Fig. 80

09493783 .012800

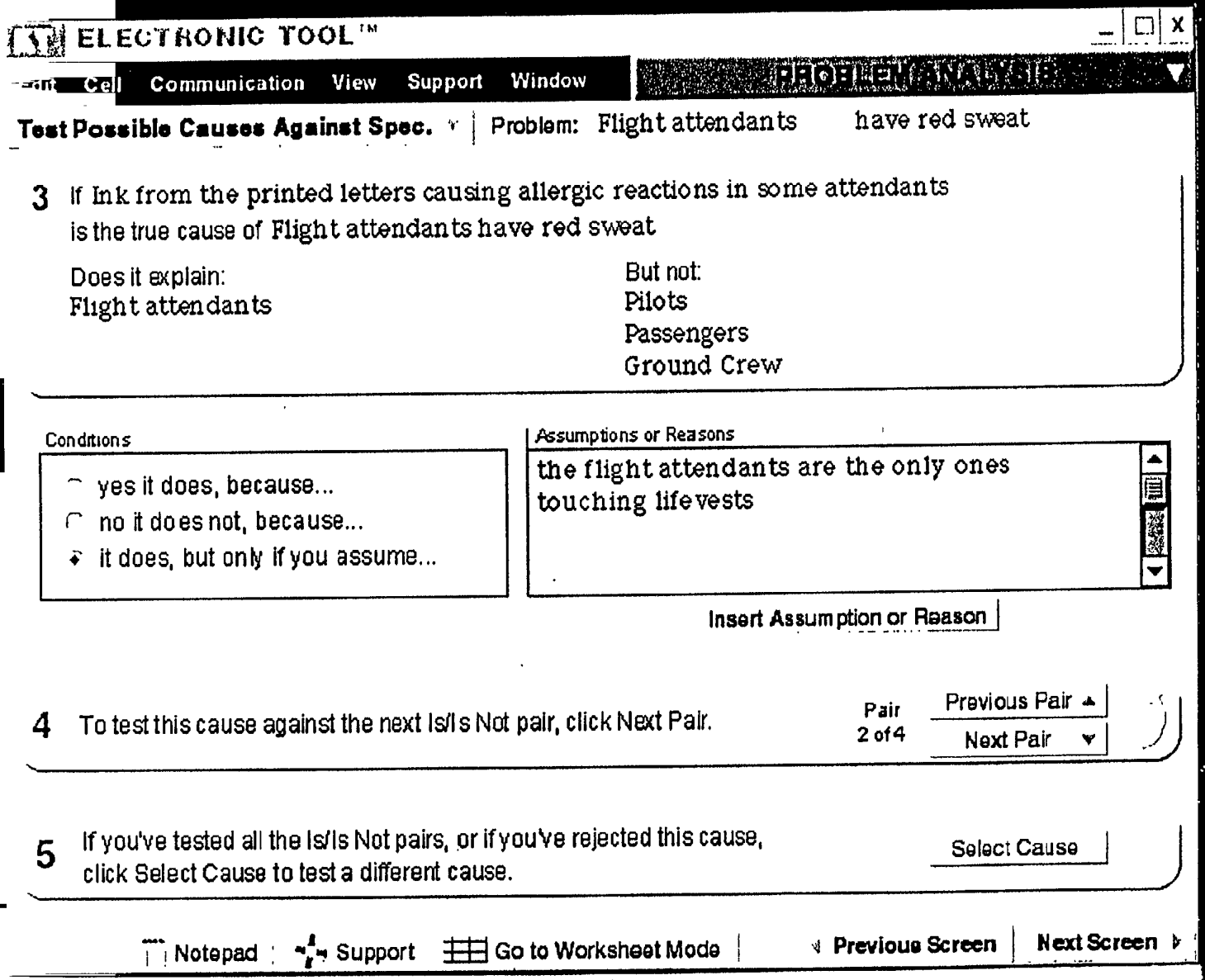

ELECTRONIC TOOL™
Communication
View
Support
Window
PROBLEM ANALYSIS
Test Possible Causes Against Spec.
Problem: Flight attendants have red sweat
3 If Ink from the printed letters causing allergic reactions in some attendants is the true cause of Flight attendants have red sweat
Does it explain:
Flight attendants
But not:
Pilots
Passengers
Ground Crew
Conditions
yes it does, because...
no it does not, because...
it does, but only if you assume...
Assumptions or Reasons
the flight attendants are the only ones touching lifevests
Insert Assumption or Reason
4 To test this cause against the next Is/Is Not pair, click Next Pair.
Pair 2 of 4
Previous Pair
Next Pair
5 If you've tested all the Is/Is Not pairs, or if you've rejected this cause, click Select Cause to test a different cause.
Select Cause
Notepad
Support
Go to Worksheet Mode
Previous Screen
Next Screen

Fig. 81

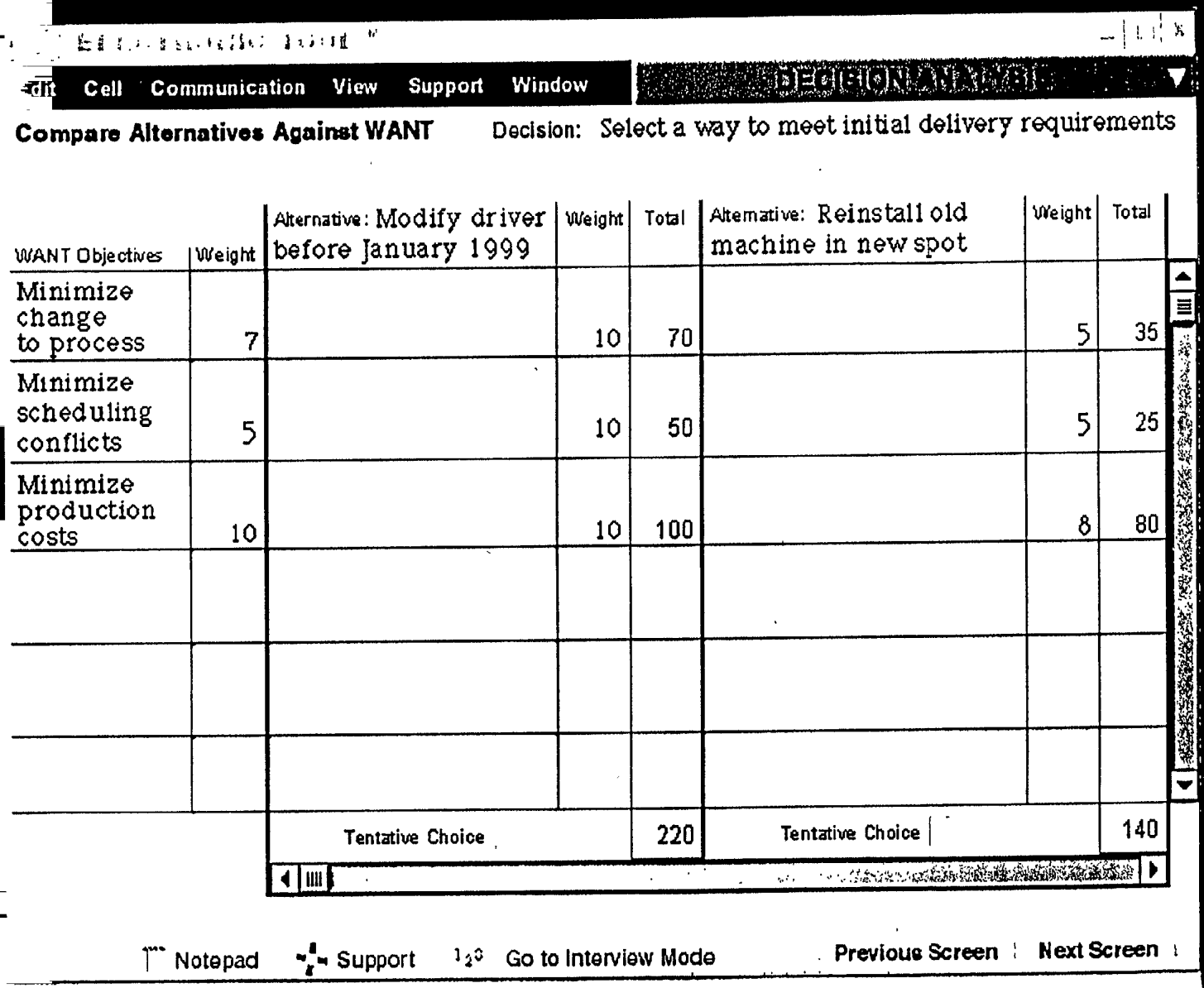

Edit Cell Communication View Support Window
DECISION ANALYSIS
Compare Alternatives Against WANT
Decision: Select a way to meet initial delivery requirements
WANT Objectives
Weight
Alternative: Modify driver before January 1999
Weight
Total
Alternative: Reinstall old machine in new spot
Weight
Total
Minimize change to process
7
10
70
5
35
Minimize scheduling conflicts
5
10
50
5
25
Minimize production costs
10
10
100
8
80
Tentative Choice
220
Tentative Choice
140
Notepad
Support
Go to Interview Mode
Previous Screen
Next Screen

Fig. 82

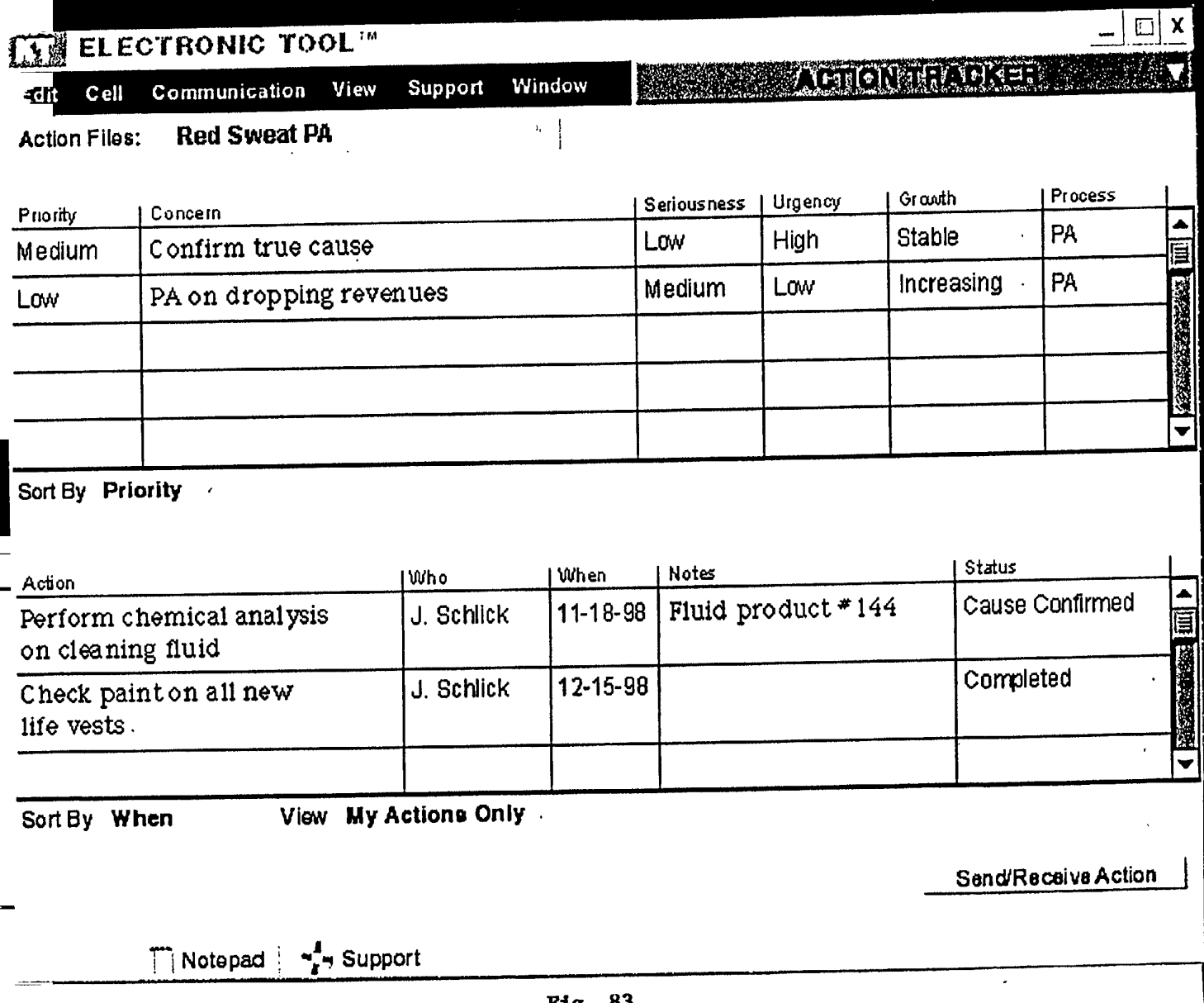

ELECTRONIC TOOL™
Edit Cell Communication View Support Window
ACTION TRACKER
Action Files: Red Sweat PA
Priority | Concern | Seriousness | Urgency | Growth | Process
Medium | Confirm true cause | Low | High | Stable | PA
Low | PA on dropping revenues | Medium | Low | Increasing | PA
Sort By Priority
Action | Who | When | Notes | Status
Perform chemical analysis on cleaning fluid | J. Schlick | 11-18-98 | Fluid product #144 | Cause Confirmed
Check paint on all new life vests. | J. Schlick | 12-15-98 | | Completed
Sort By When View My Actions Only
Send/Receive Action
Notepad
Support

Fig. 83

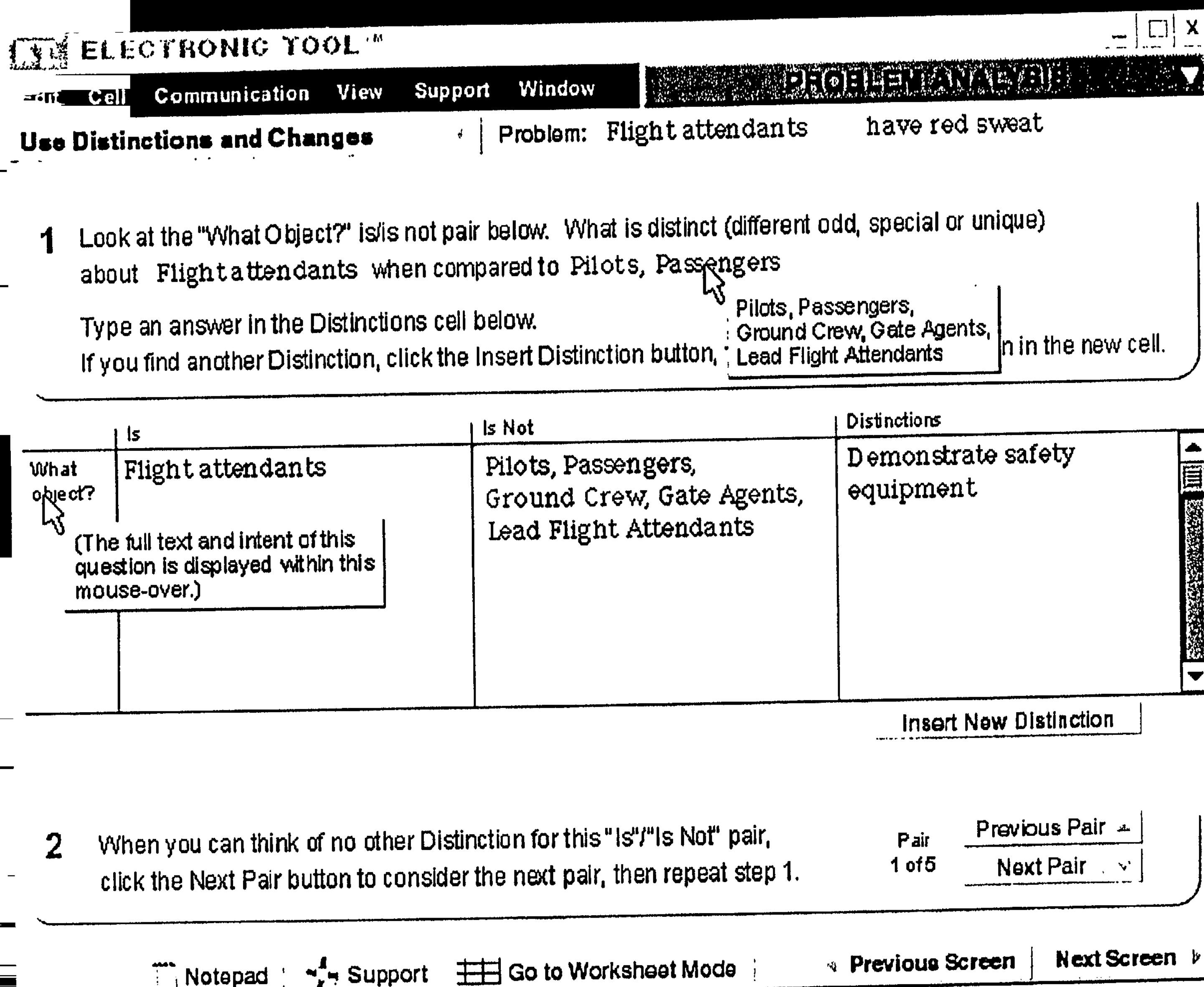


Fig. 84

09493783 .012800

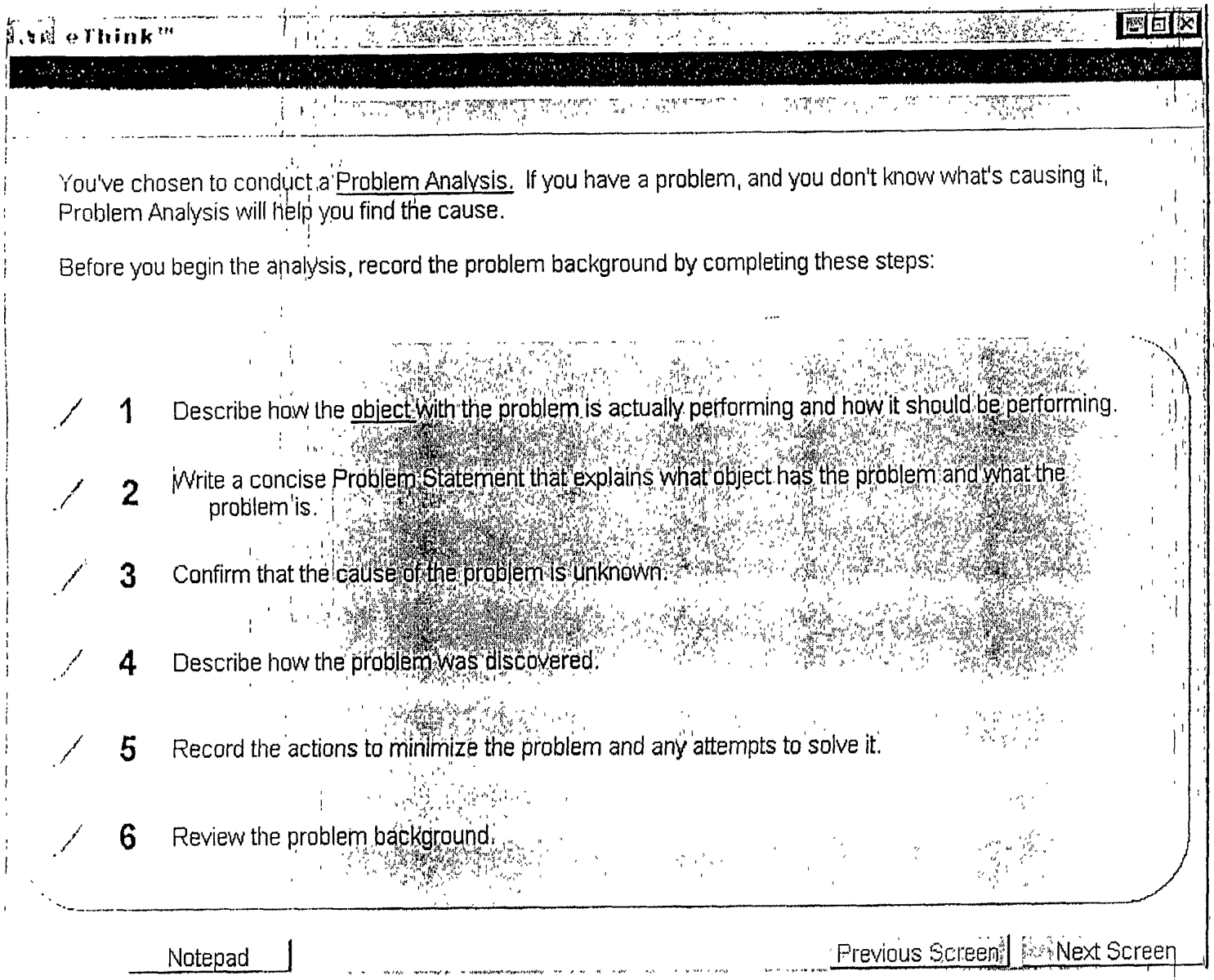


Fig. 85

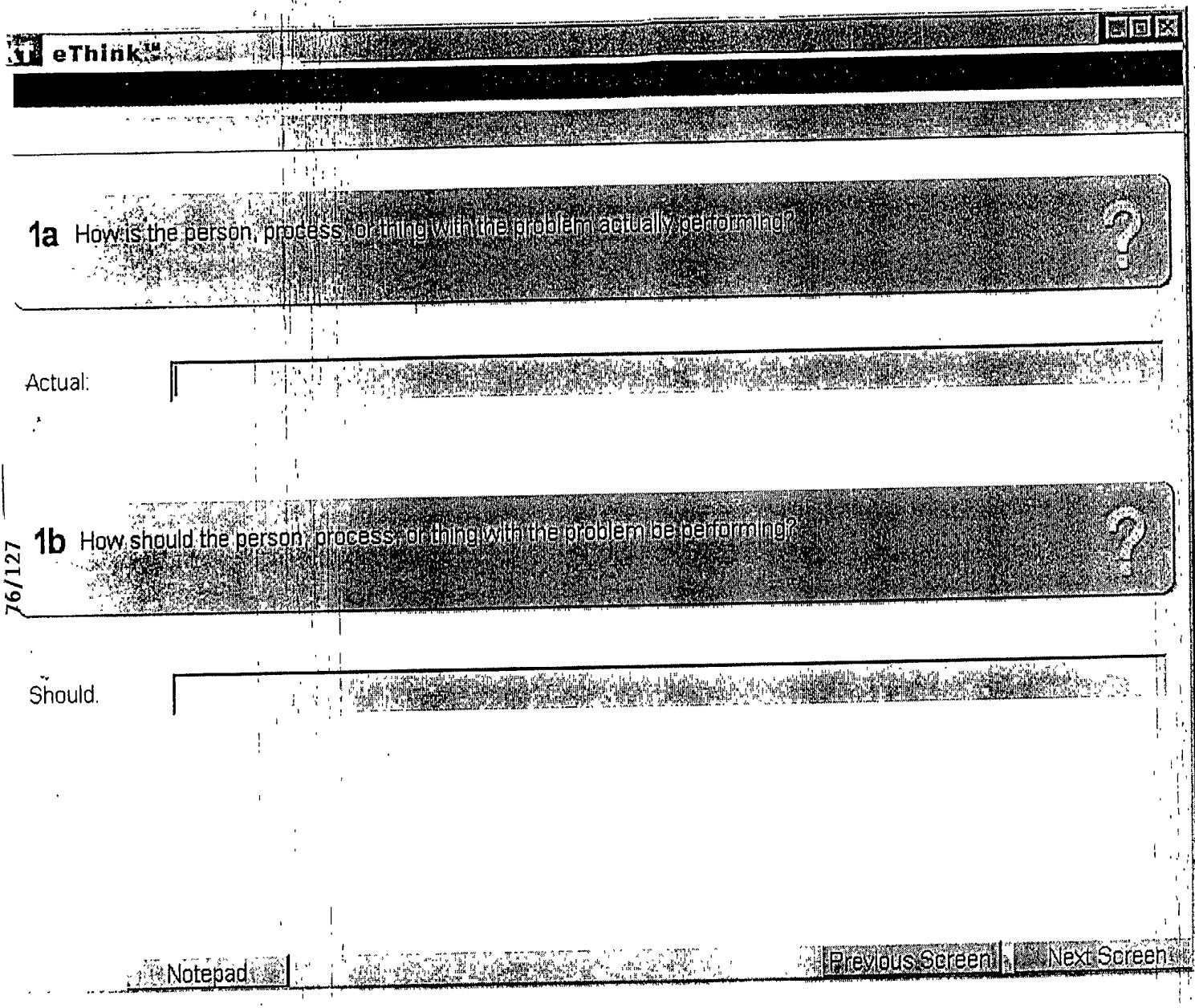


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Fig. 86

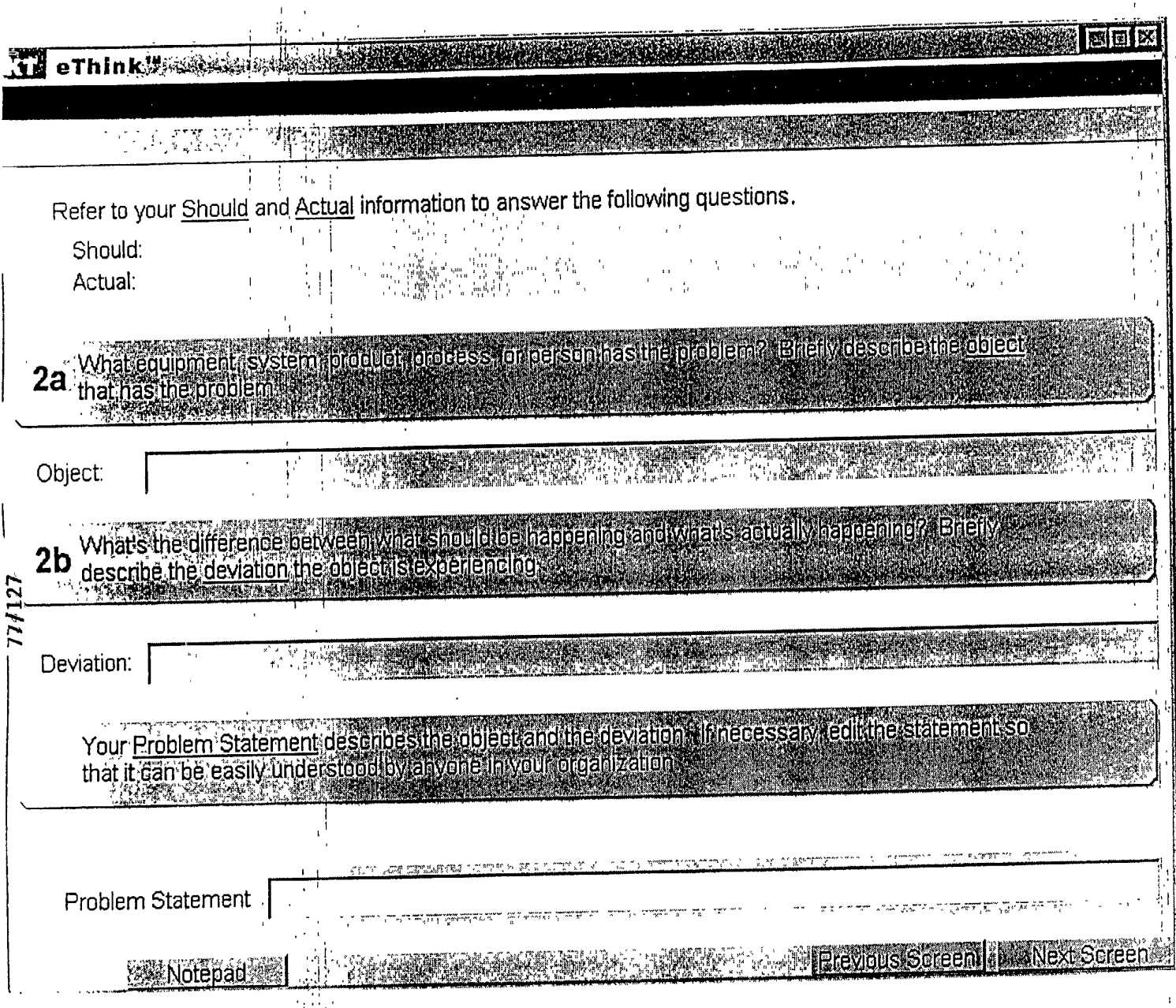
eThink!
Refer to your Should and Actual information to answer the following questions.
Should:
Actual:
2a What equipment, system, product, process, or person has the problem? Briefly describe the object that has the problem.
Object:
2b What's the difference between what should be happening and what's actually happening? Briefly describe the deviation the object is experiencing.
Deviation:
Your Problem Statement describes the object and the deviation. If necessary, edit the statement so that it can be easily understood by anyone in your organization.
Problem Statement
Notepad
Previous Screen
Next Screen

Fig. 87

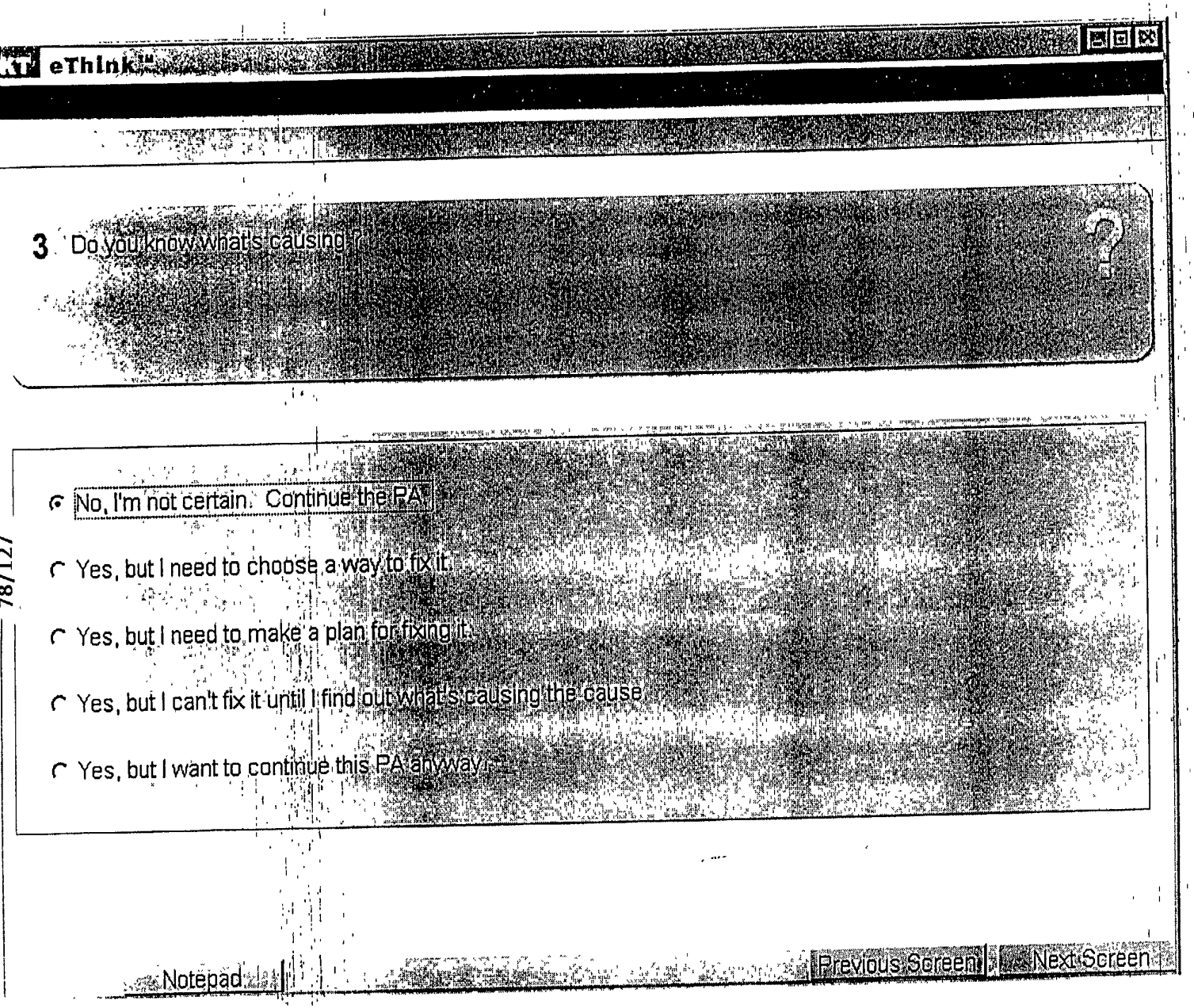
eThink™
3 Do you know what's causing it?
No, I'm not certain. Continue the PA.
Yes, but I need to choose a way to fix it.
Yes, but I need to make a plan for fixing it.
Yes, but I can't fix it until I find out what's causing the cause.
Yes, but I want to continue this PA anyway.
Notepad
Previous Screen
Next Screen

Fig. 88

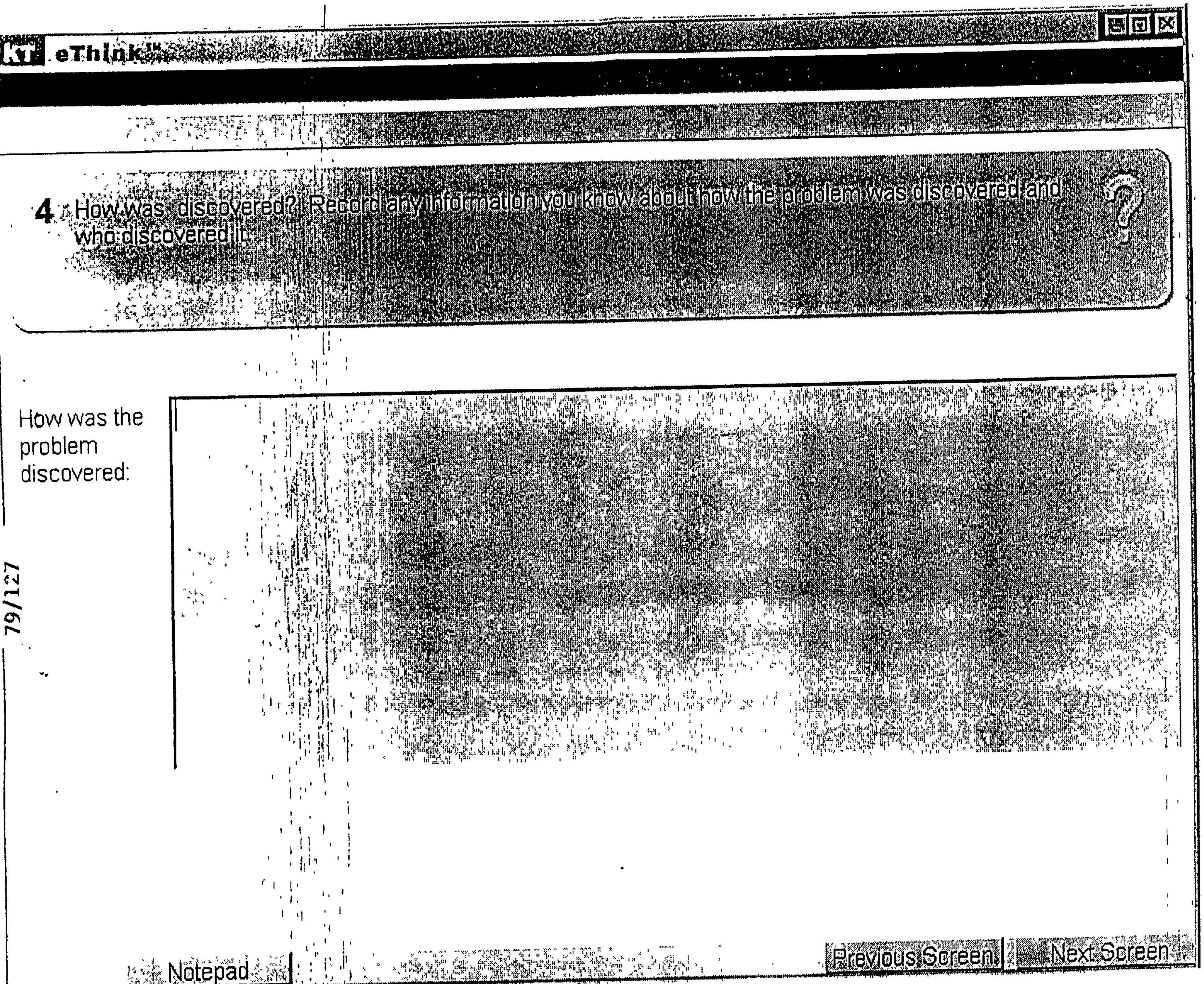
eThink™
4 How was discovered? Record any information you know about how the problem was discovered and who discovered it.
How was the problem discovered:
Notepad
Previous Screen
Next Screen

Fig. 89

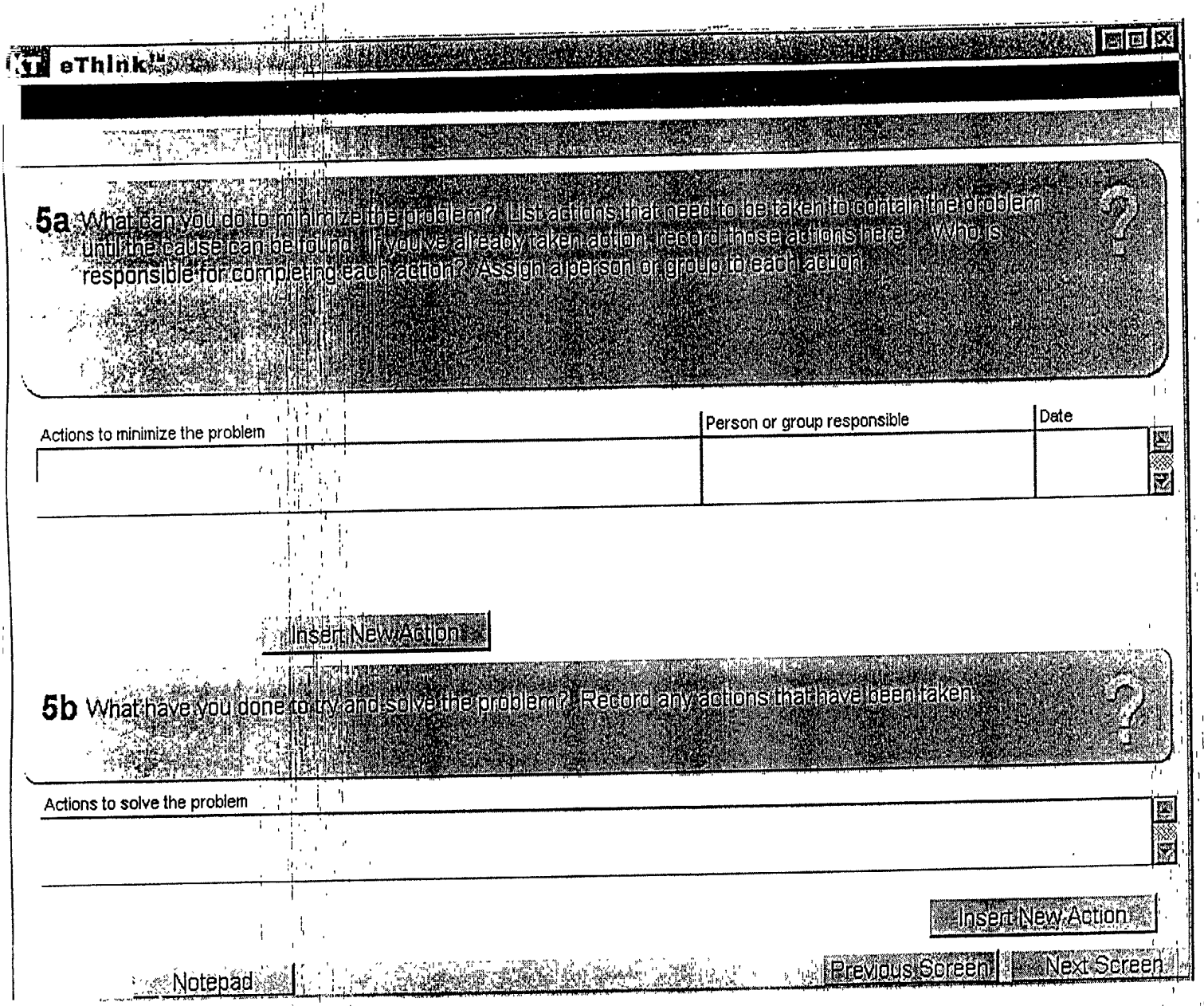
eThink!
5a What can you do to minimize the problem? List actions that need to be taken to contain the problem until the cause can be found. If you've already taken action, record those actions here. Who is responsible for completing each action? Assign a person or group to each action.
Actions to minimize the problem
Person or group responsible
Date
Insert New Action
5b What have you done to try and solve the problem? Record any actions that have been taken.
Actions to solve the problem
Insert New Action
Notepad
Previous Screen
Next Screen

Fig. 90

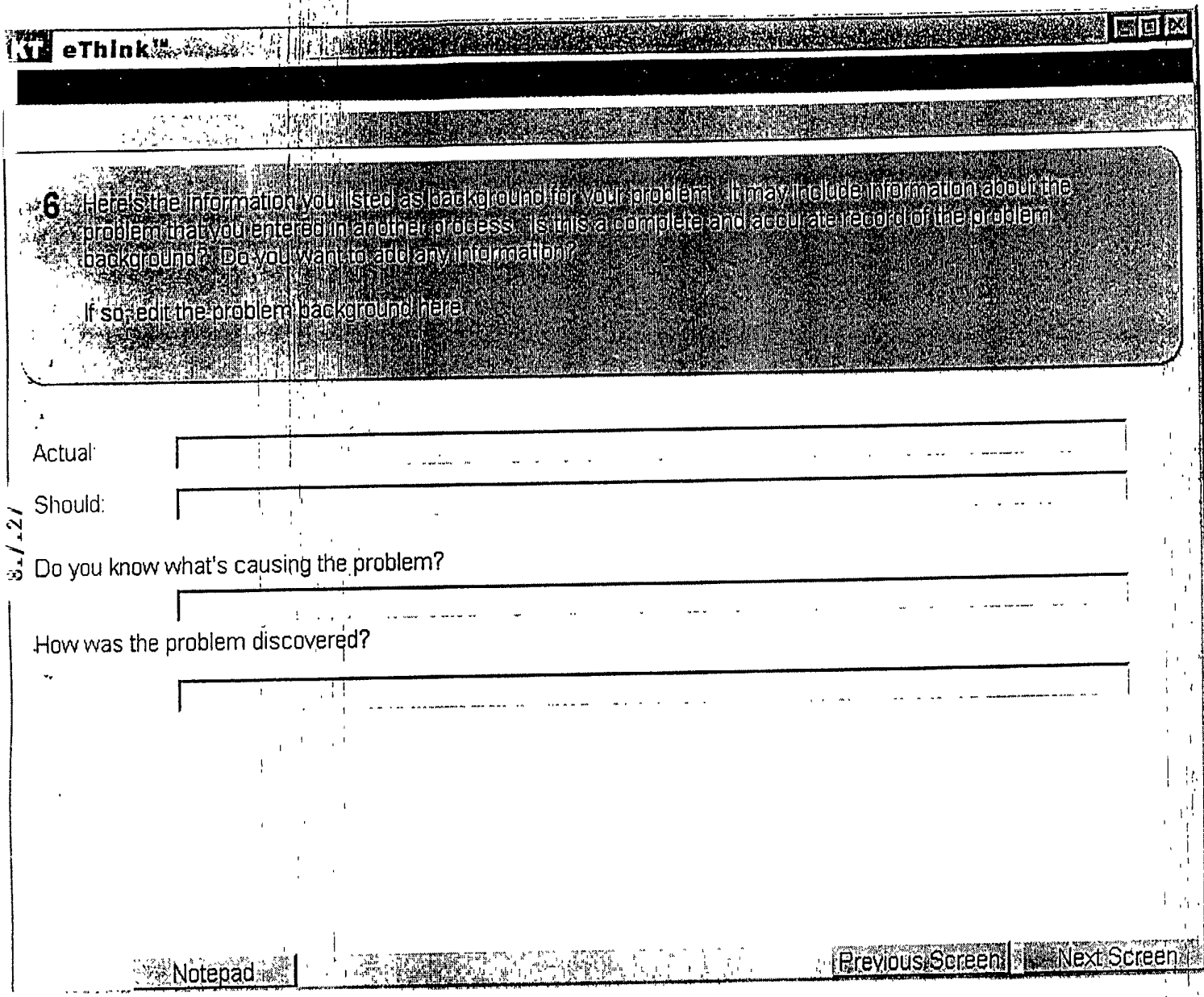

Fig. 91

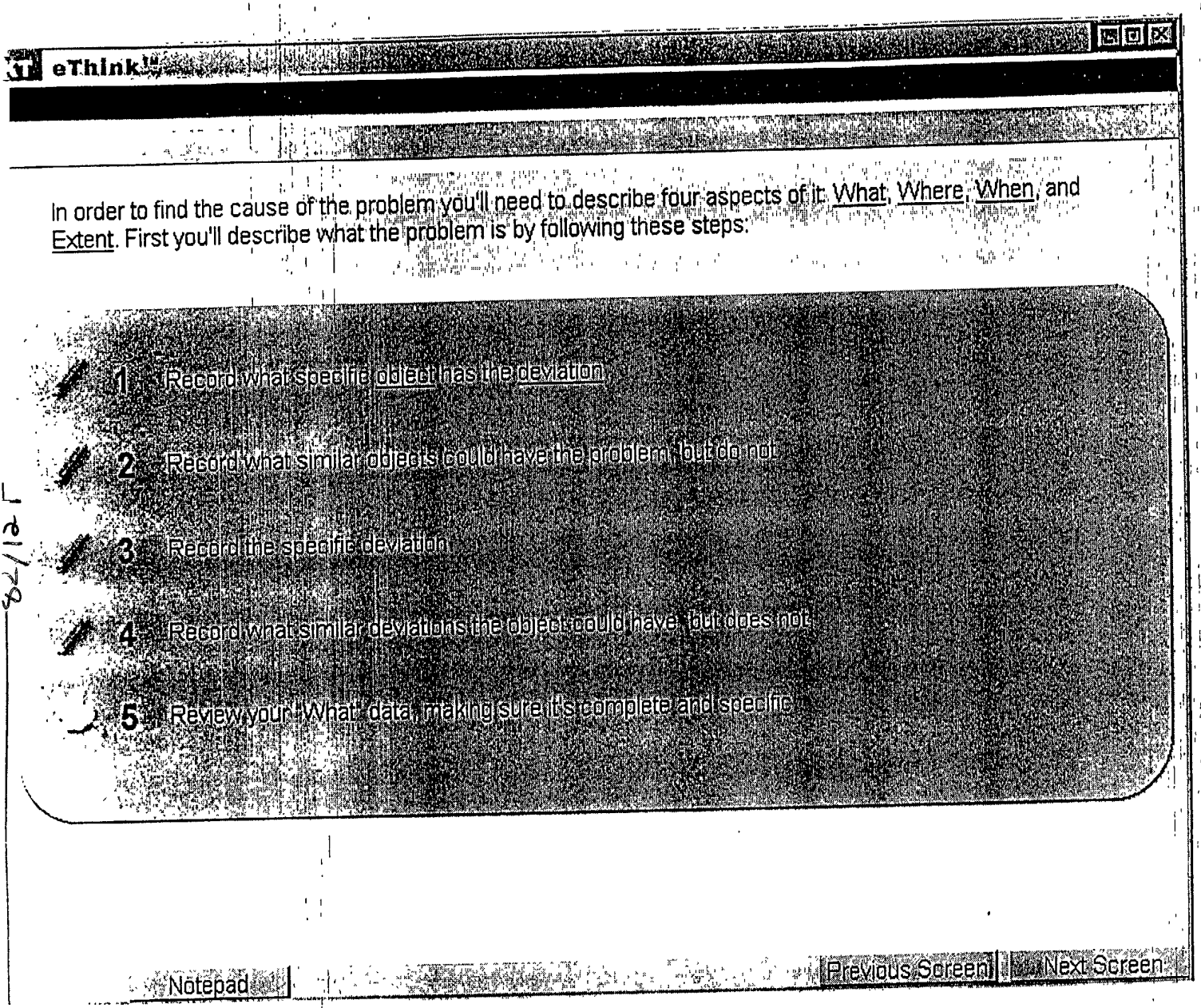

Fig. 92

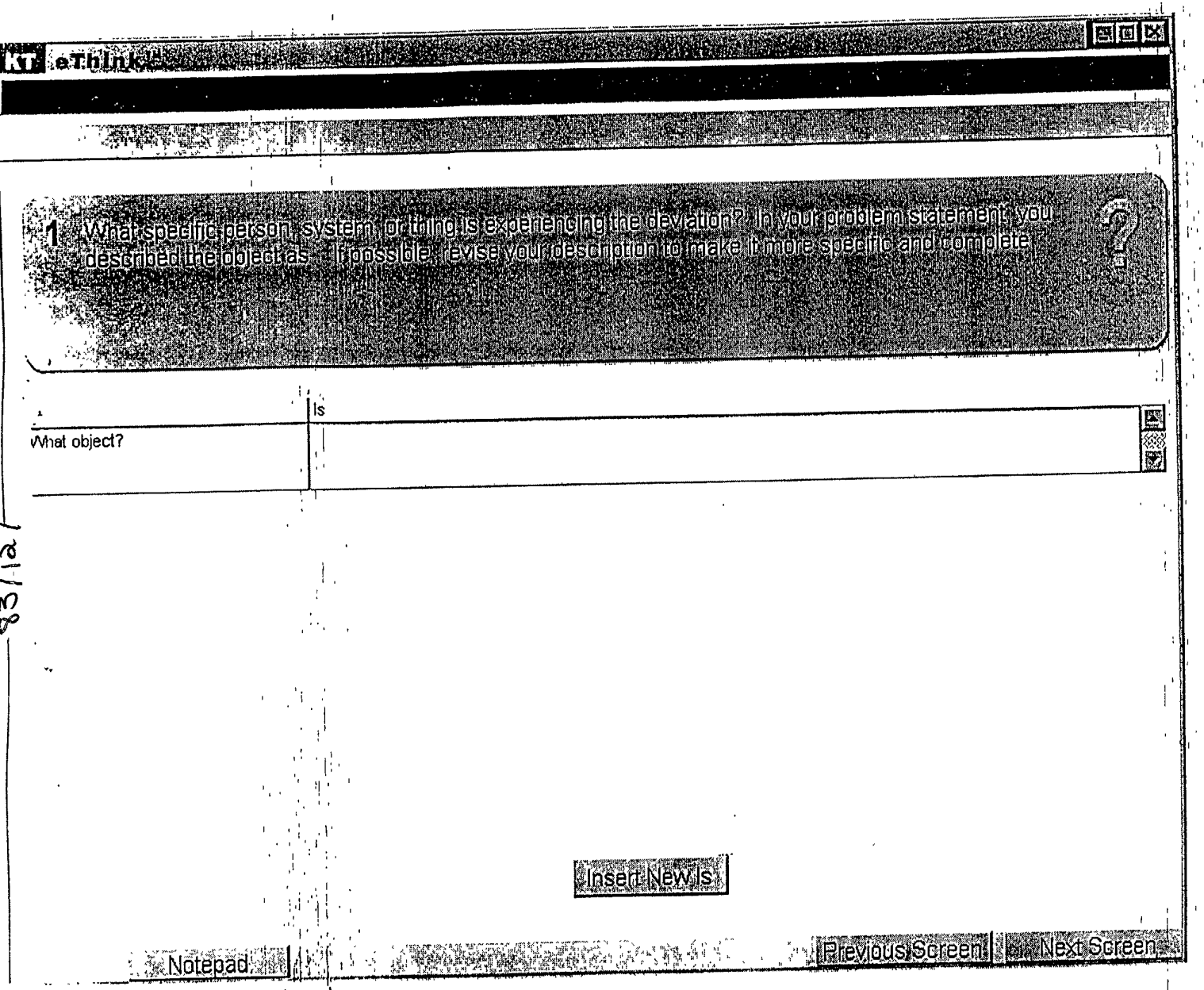

Fig. 93

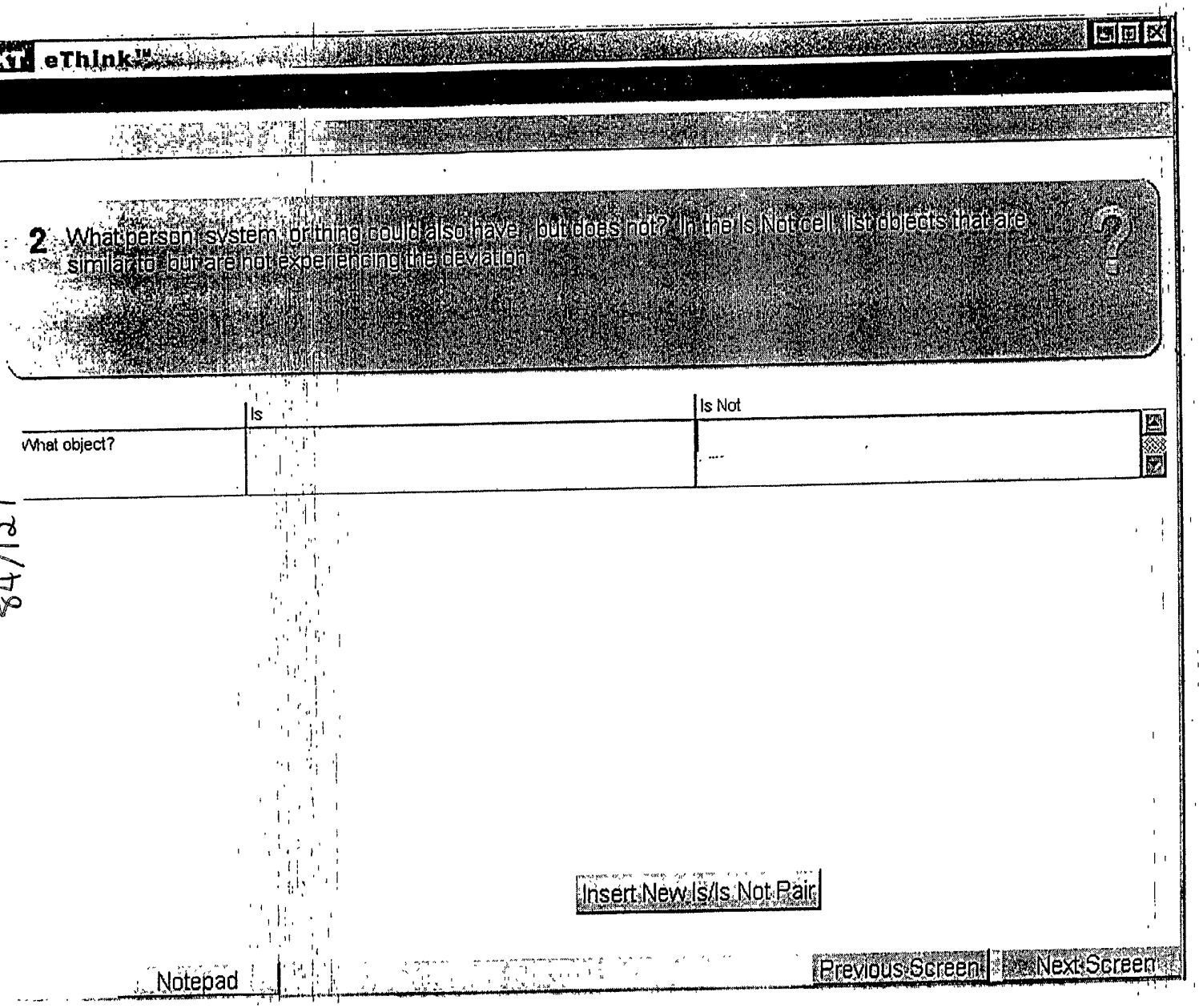
eThink
2 What person, system, or thing could also have, but does not? In the Is Not cell, list objects that are similar to, but are not experiencing the deviation
Is
Is Not
What object?
Insert New Is/Is Not Pair
Notepad
Previous Screen
Next Screen

Fig. 94

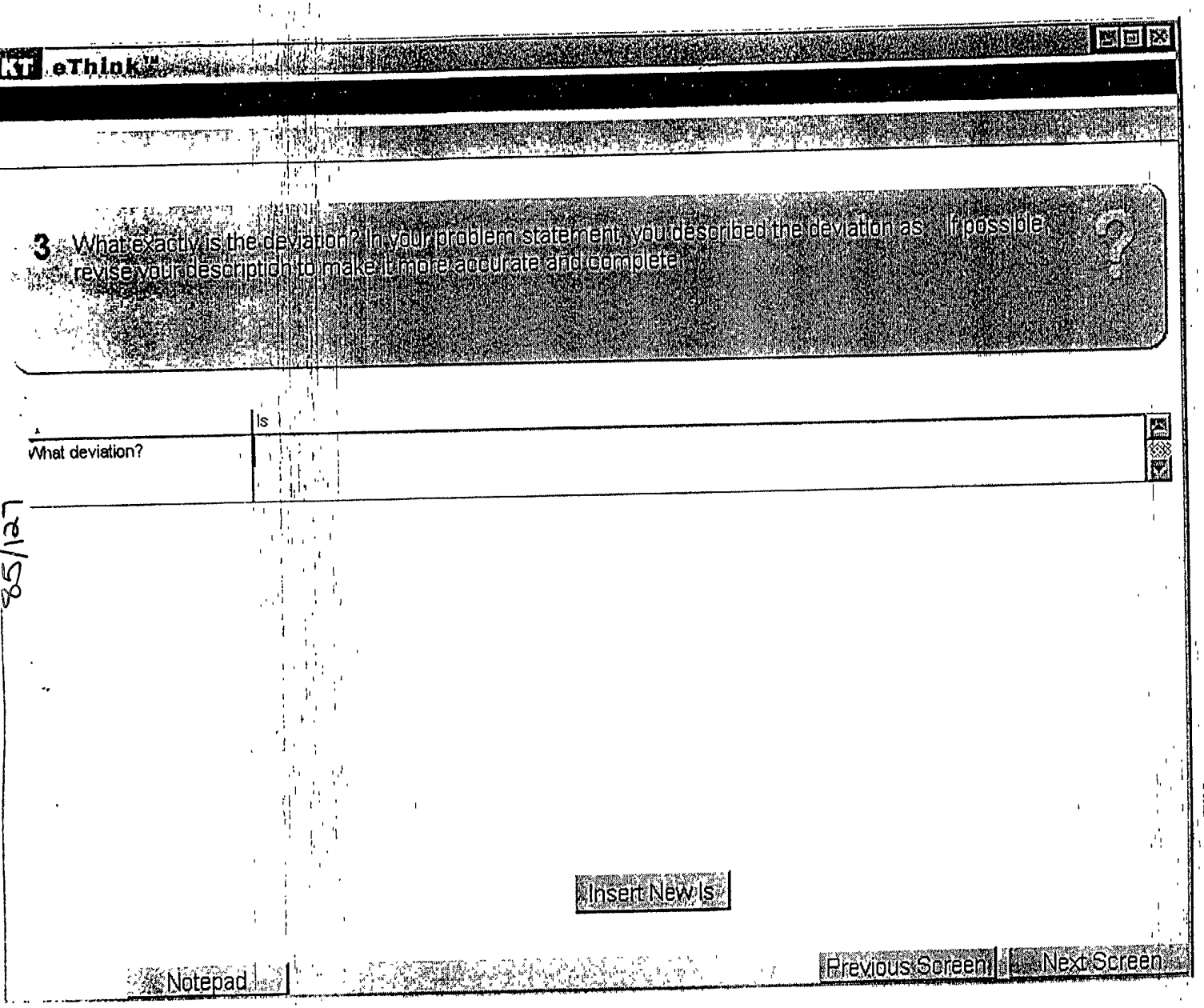

Fig. 95

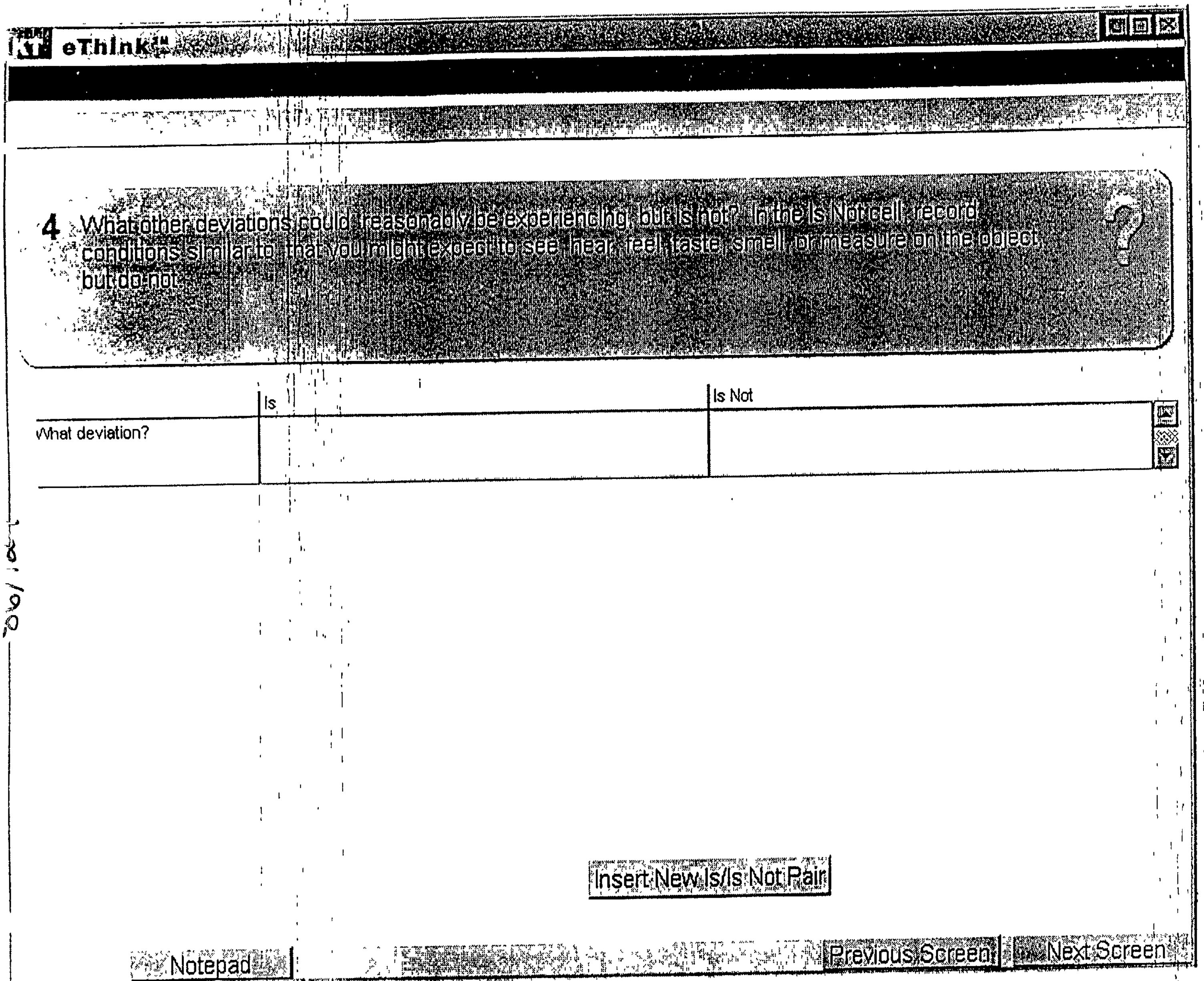

Fig. 96

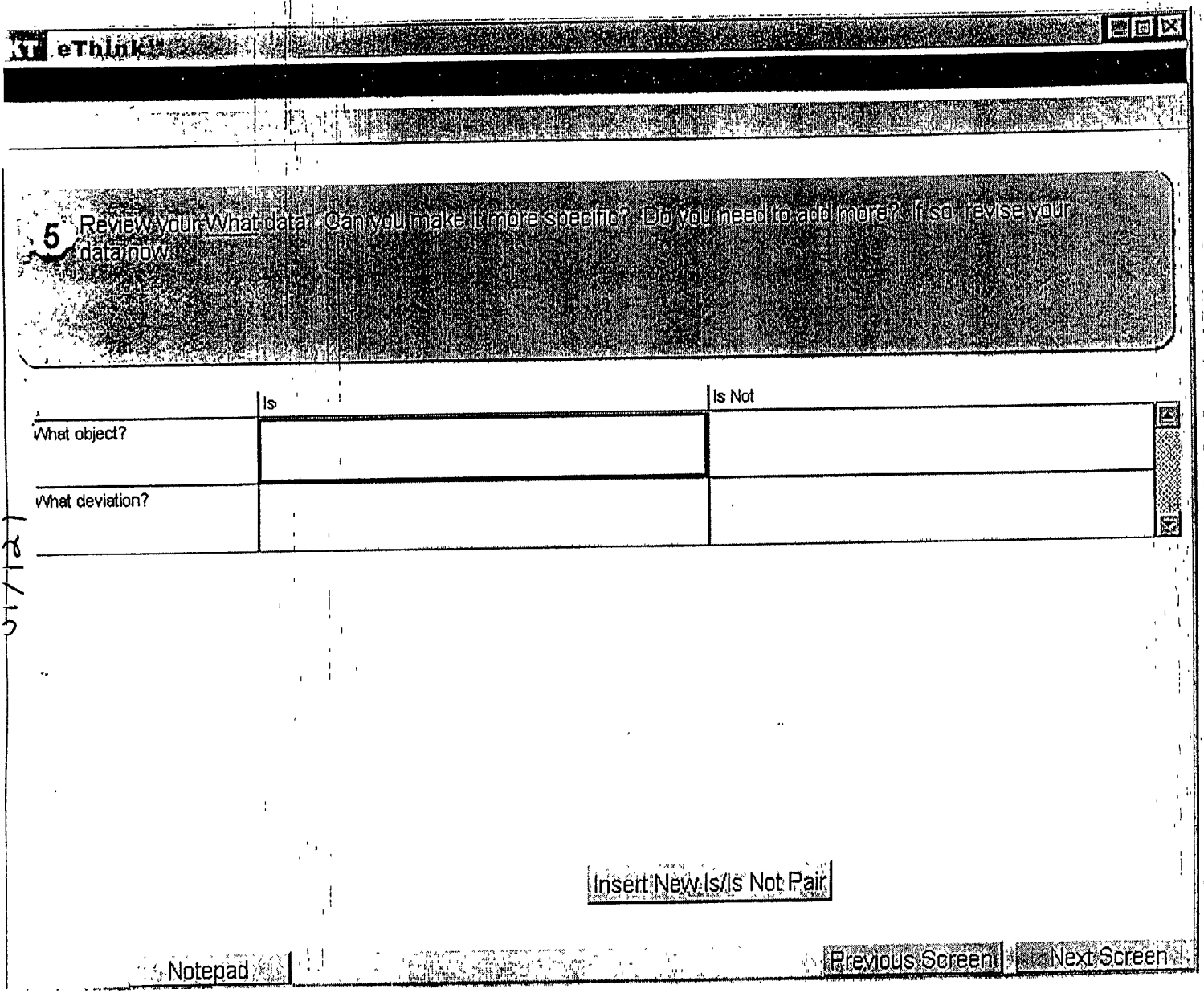
eThink
5
Review your What data. Can you make it more specific? Do you need to add more? If so, revise your data now.
Is
Is Not
What object?
What deviation?
Insert New Is/Is Not Pair
Notepad
Previous Screen
Next Screen

Fig. 97

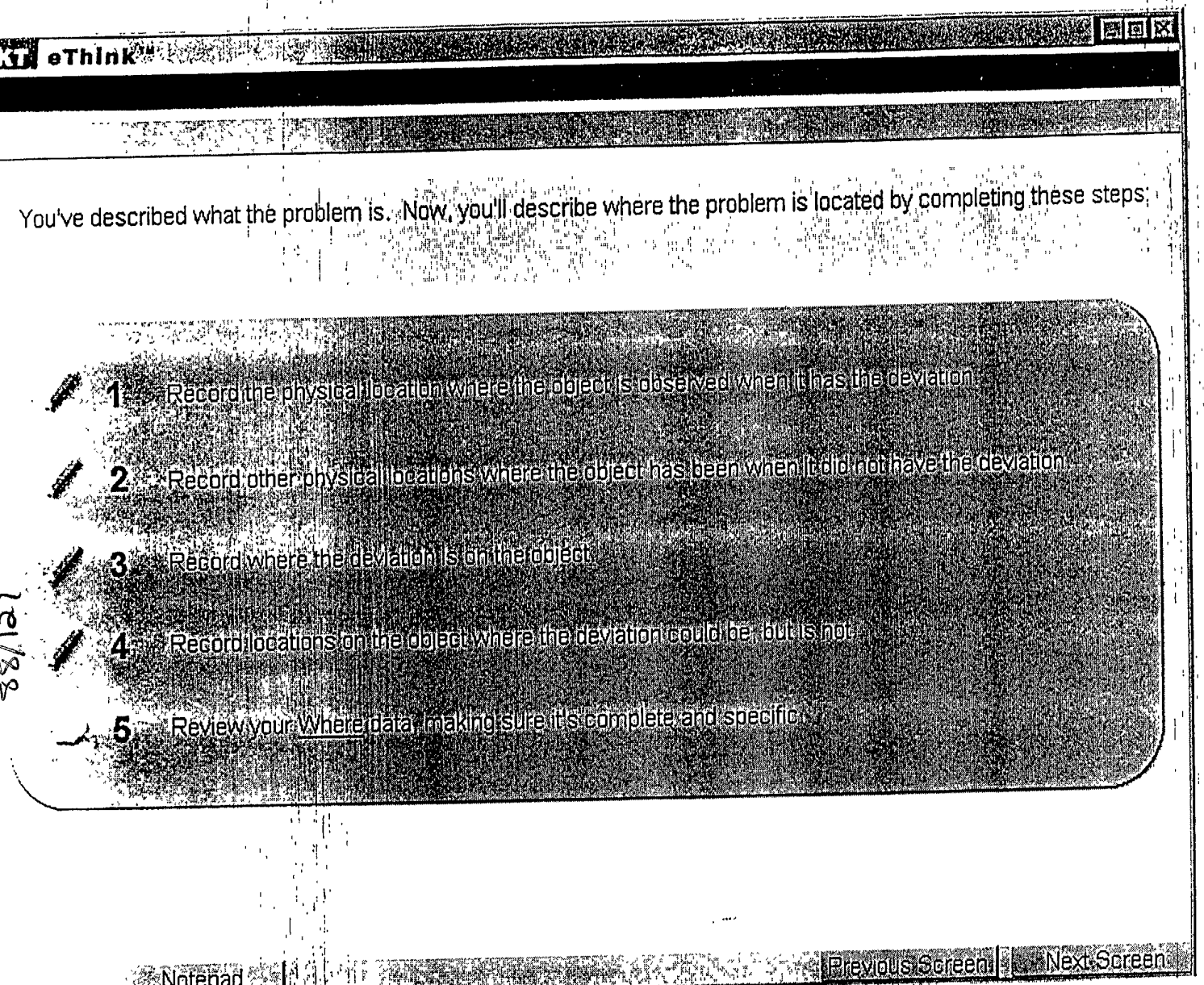

Fig. 98

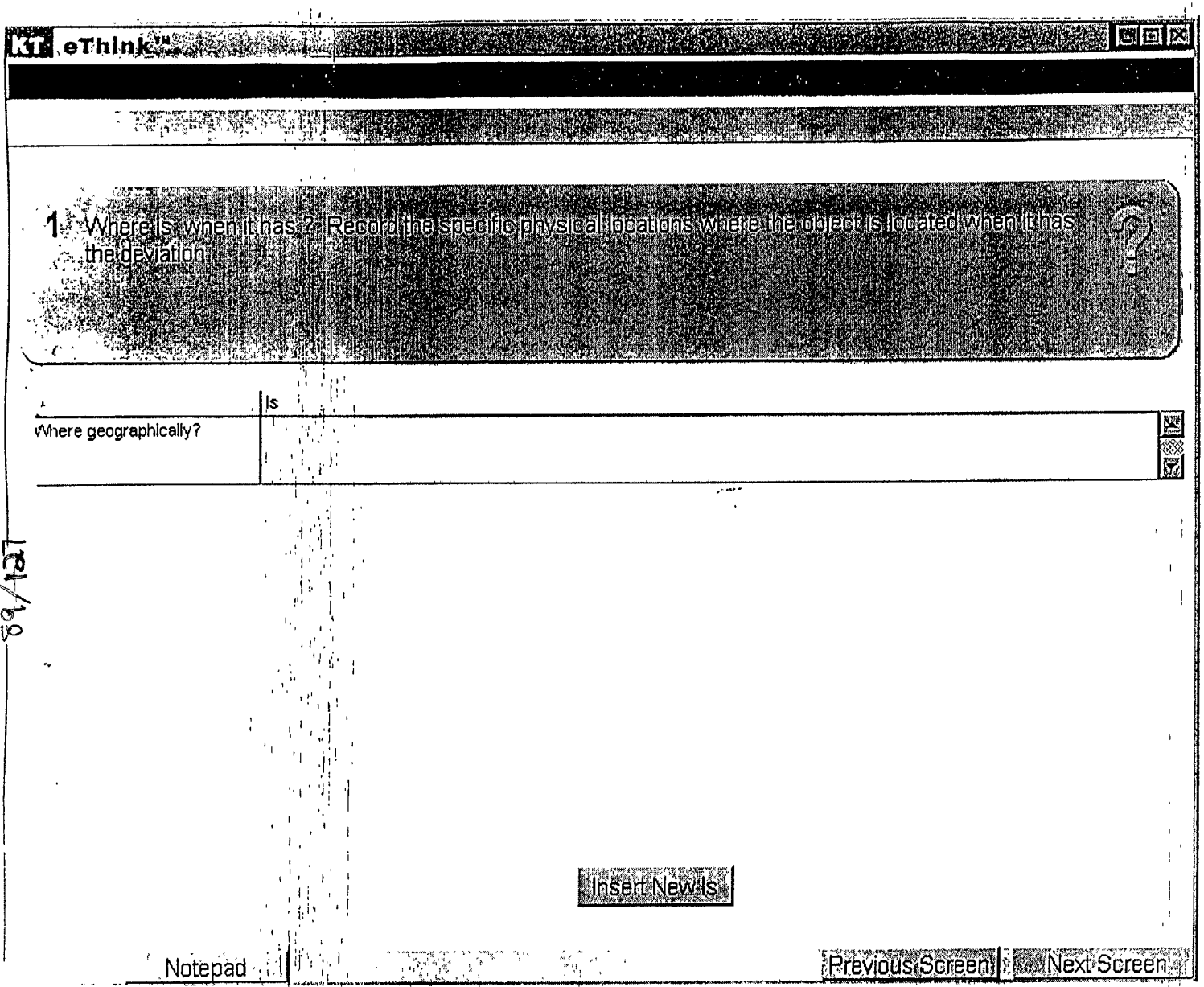

Fig. 99

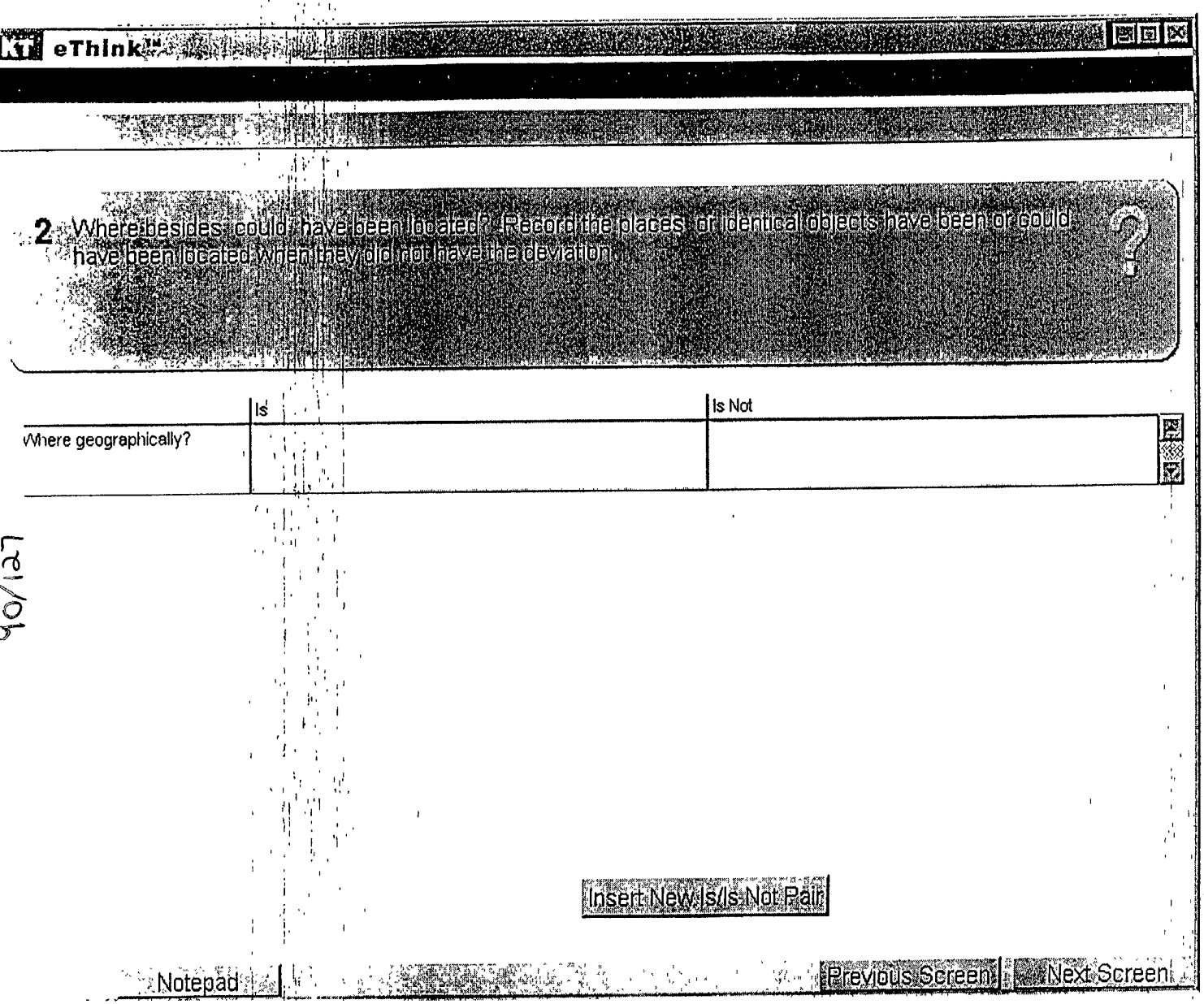
eThink™
2 Where besides: could have been located? Record the places of identical objects have been or could have been located when they did not have the deviation.
Is
Is Not
Where geographically?
Insert New Is/Is Not Pair
Notepad
Previous Screen
Next Screen

Fig. 100

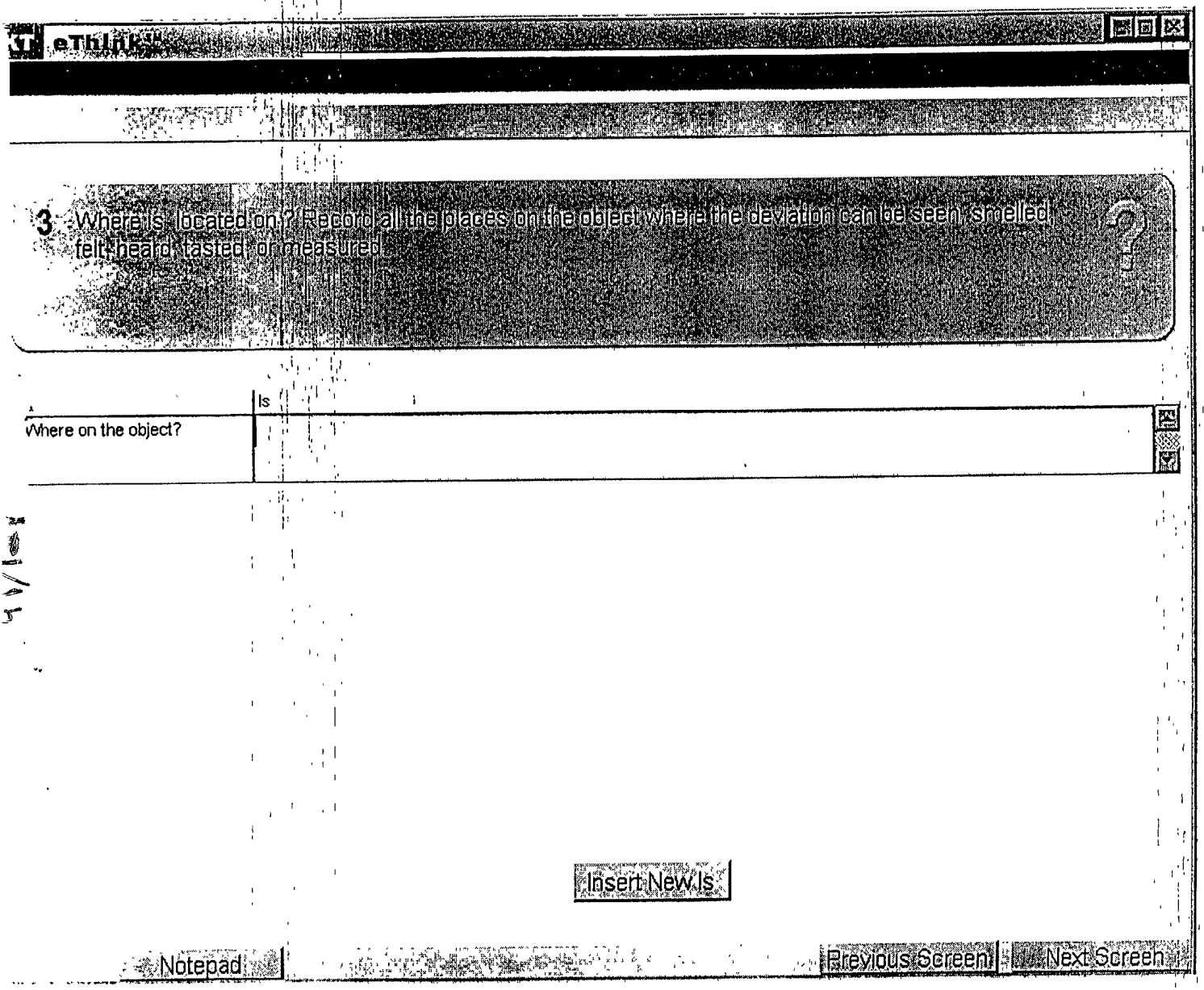

Fig. 101

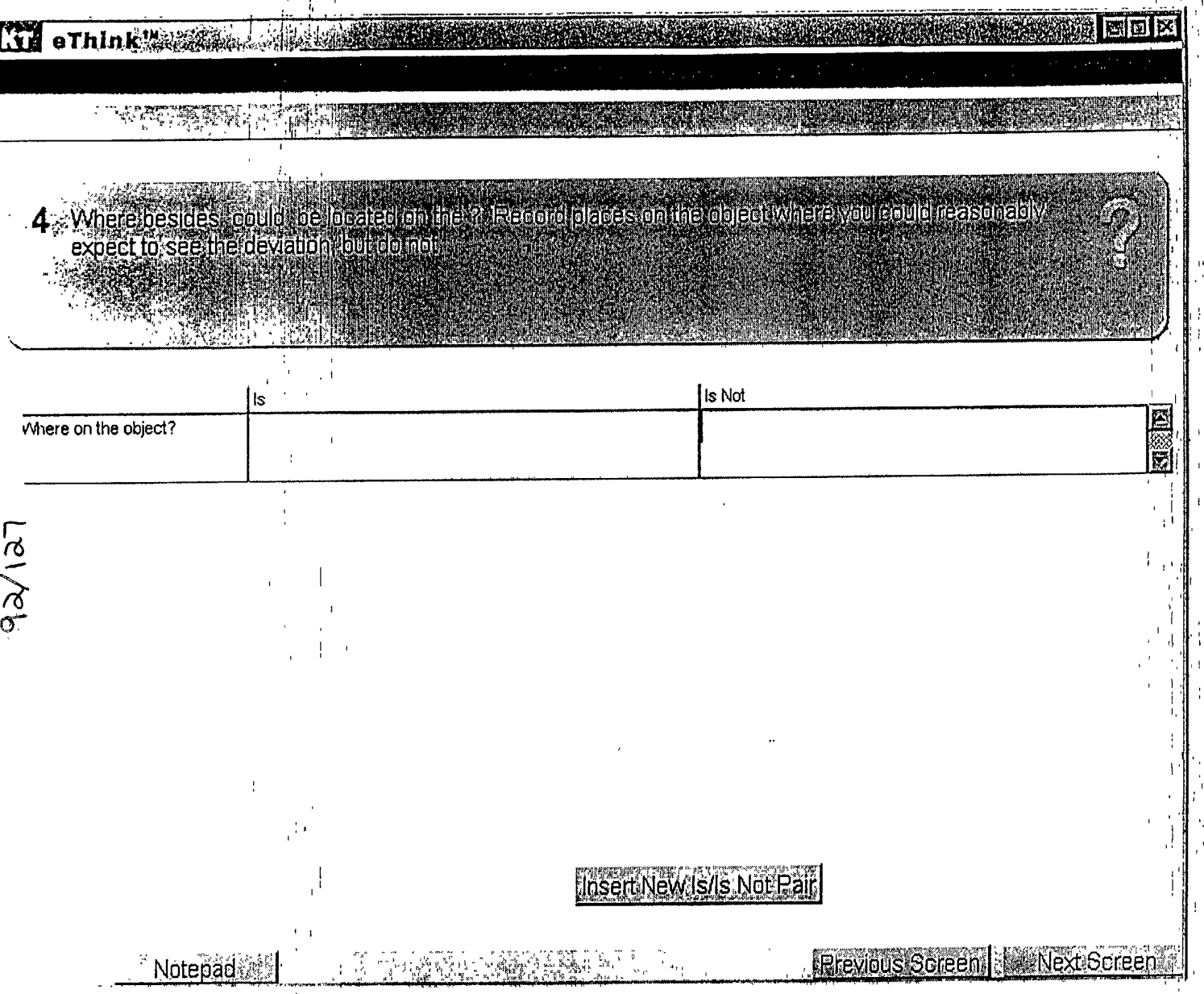

Fig. 102

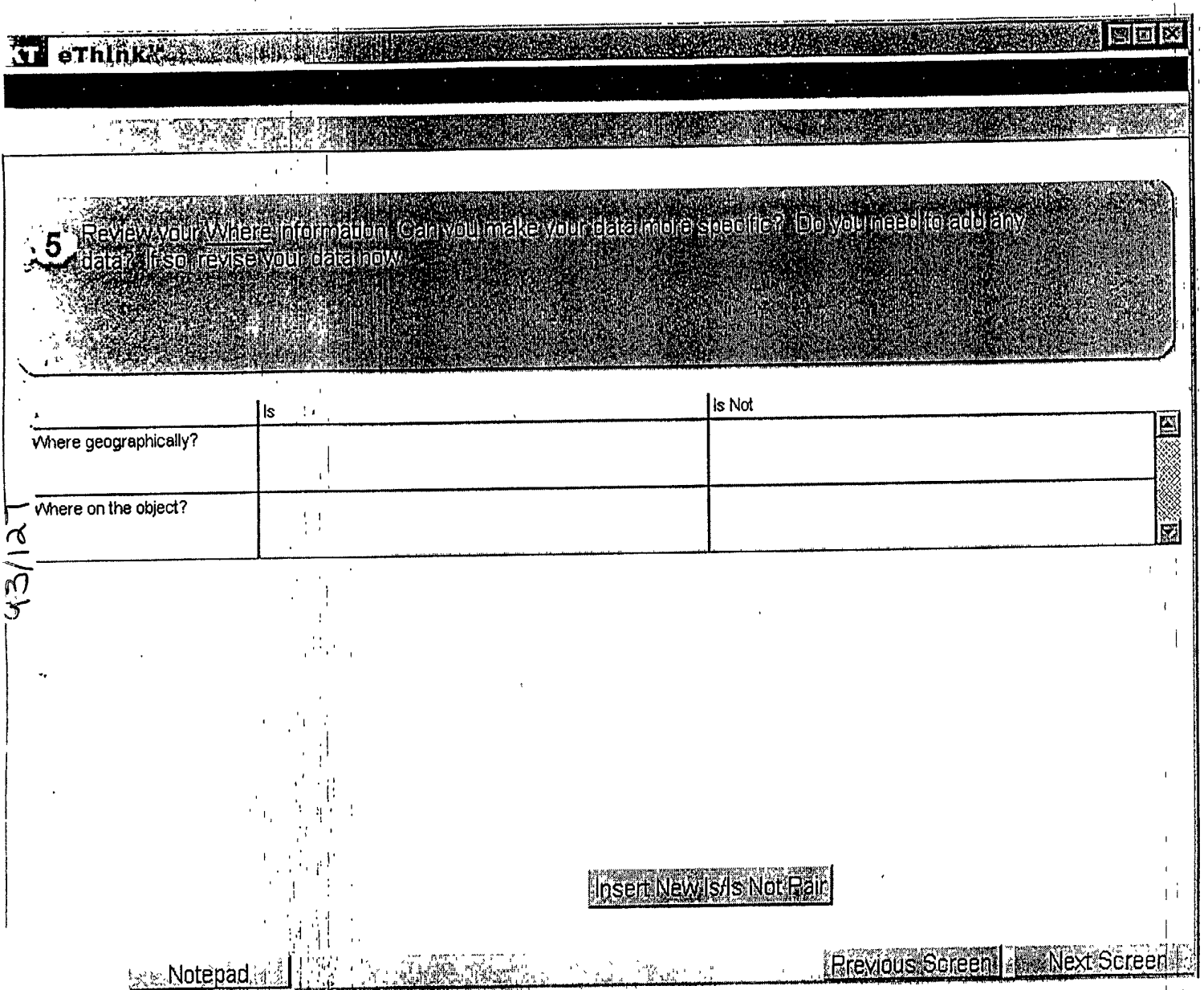

Fig. 103

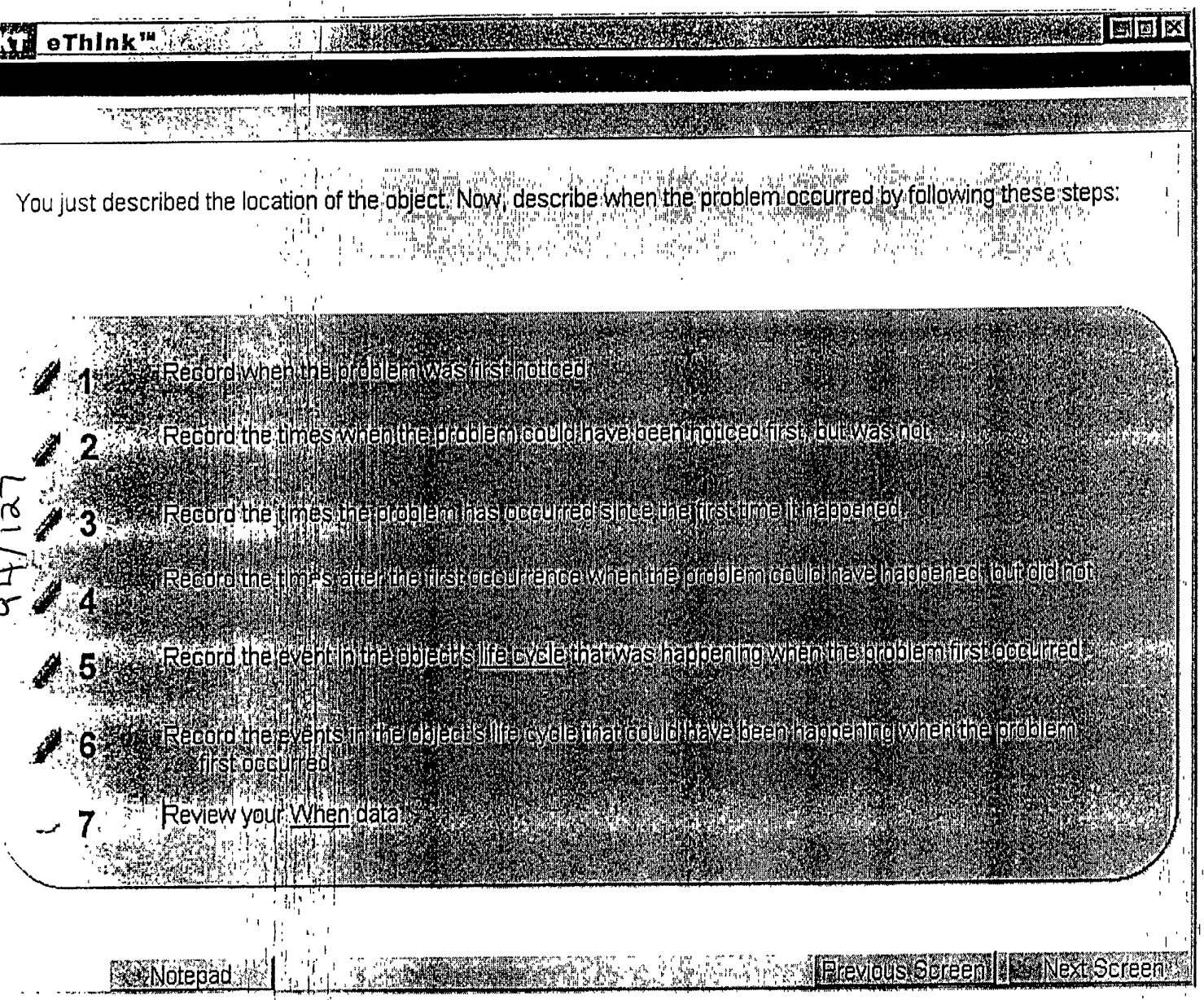

Fig. 104

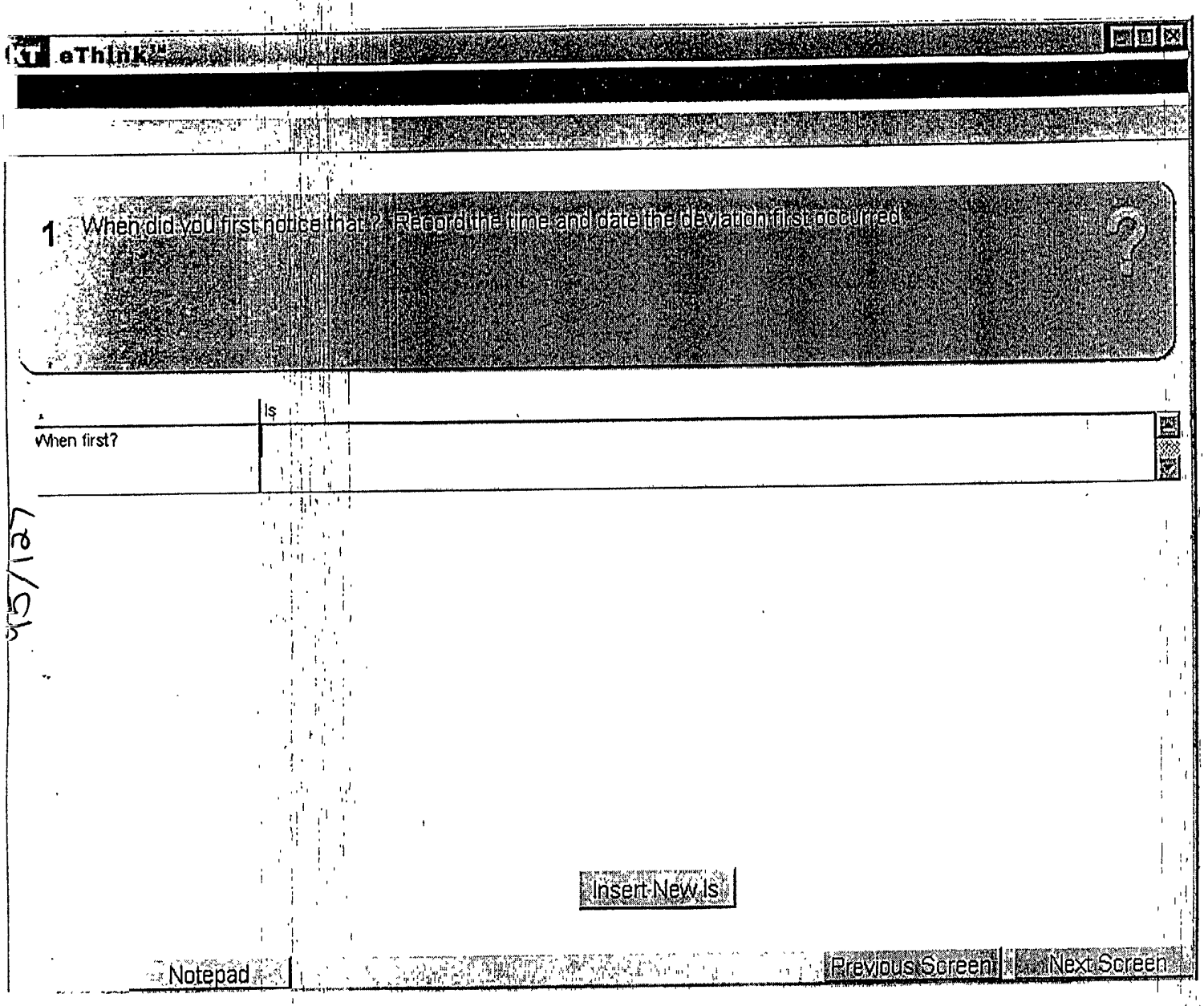

Fig. 105

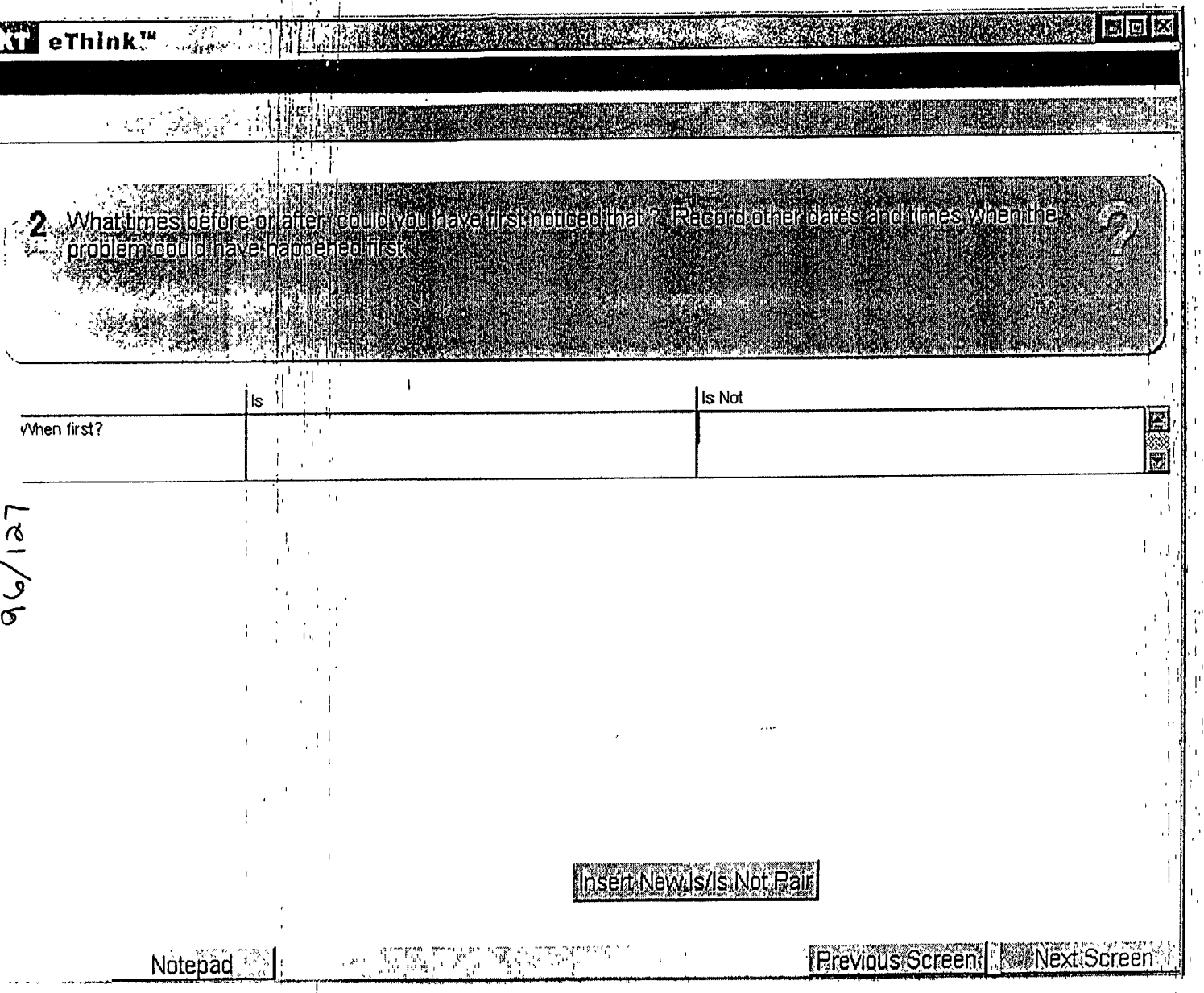

Fig. 106

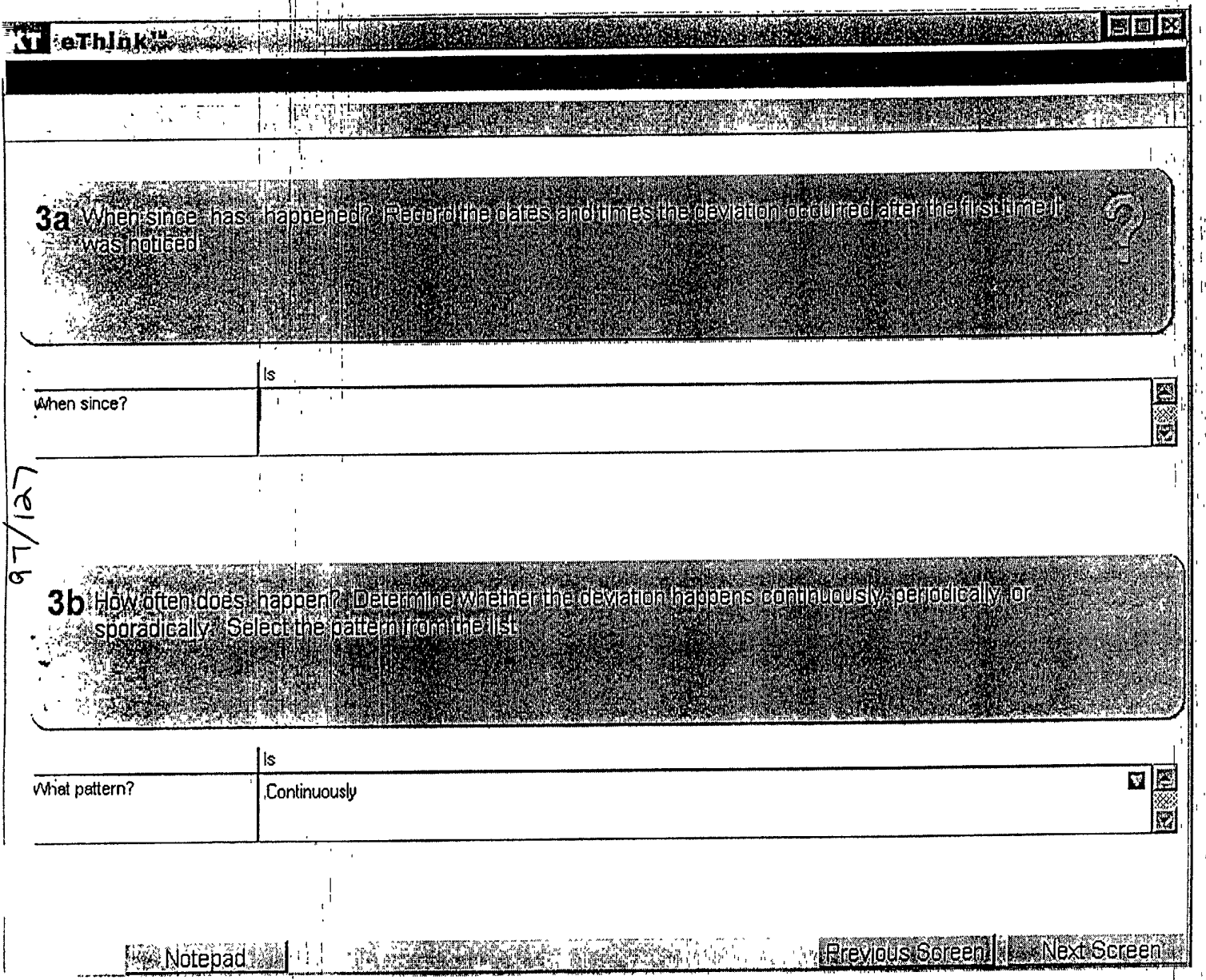

Fig. 107

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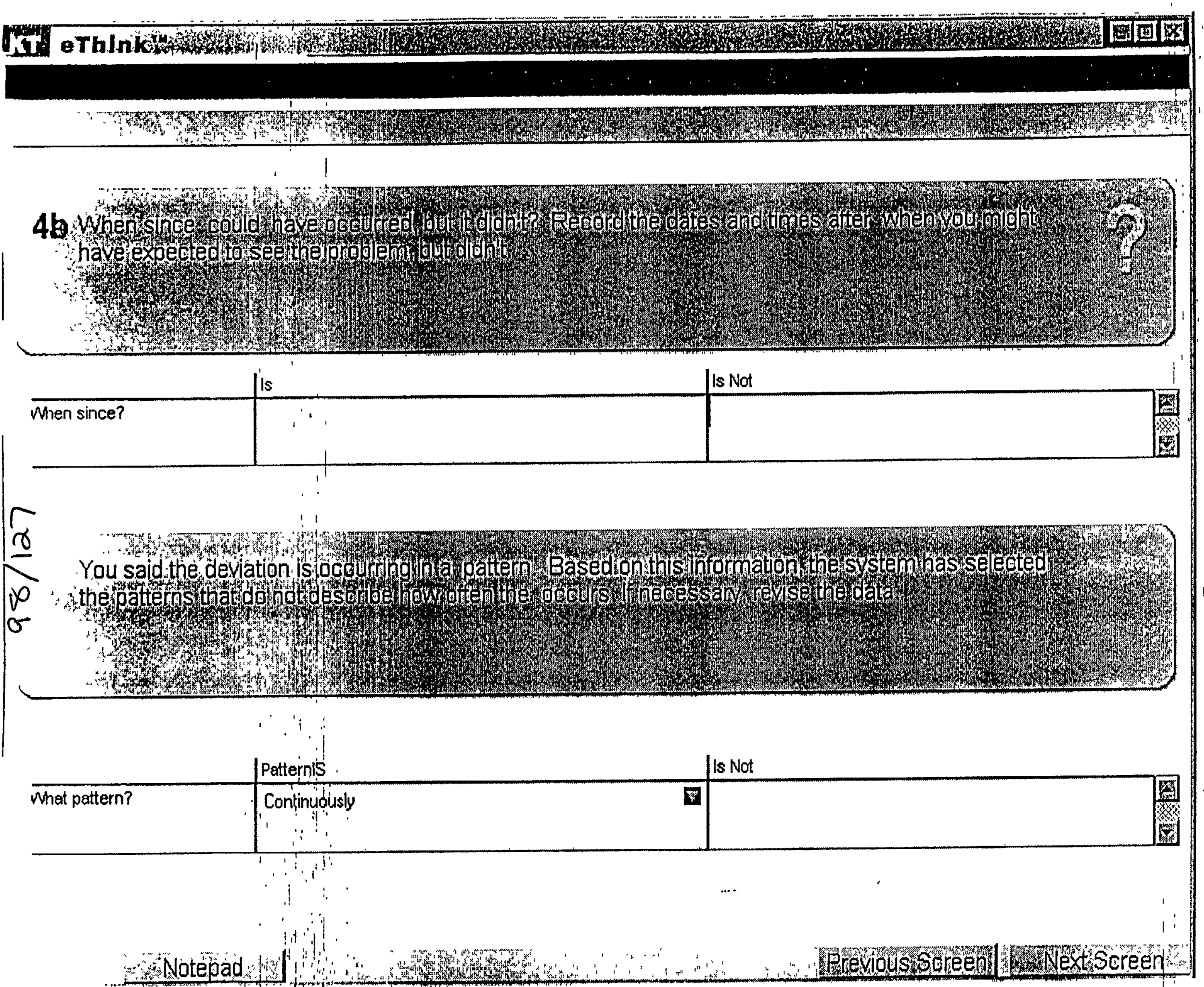

Fig. 108

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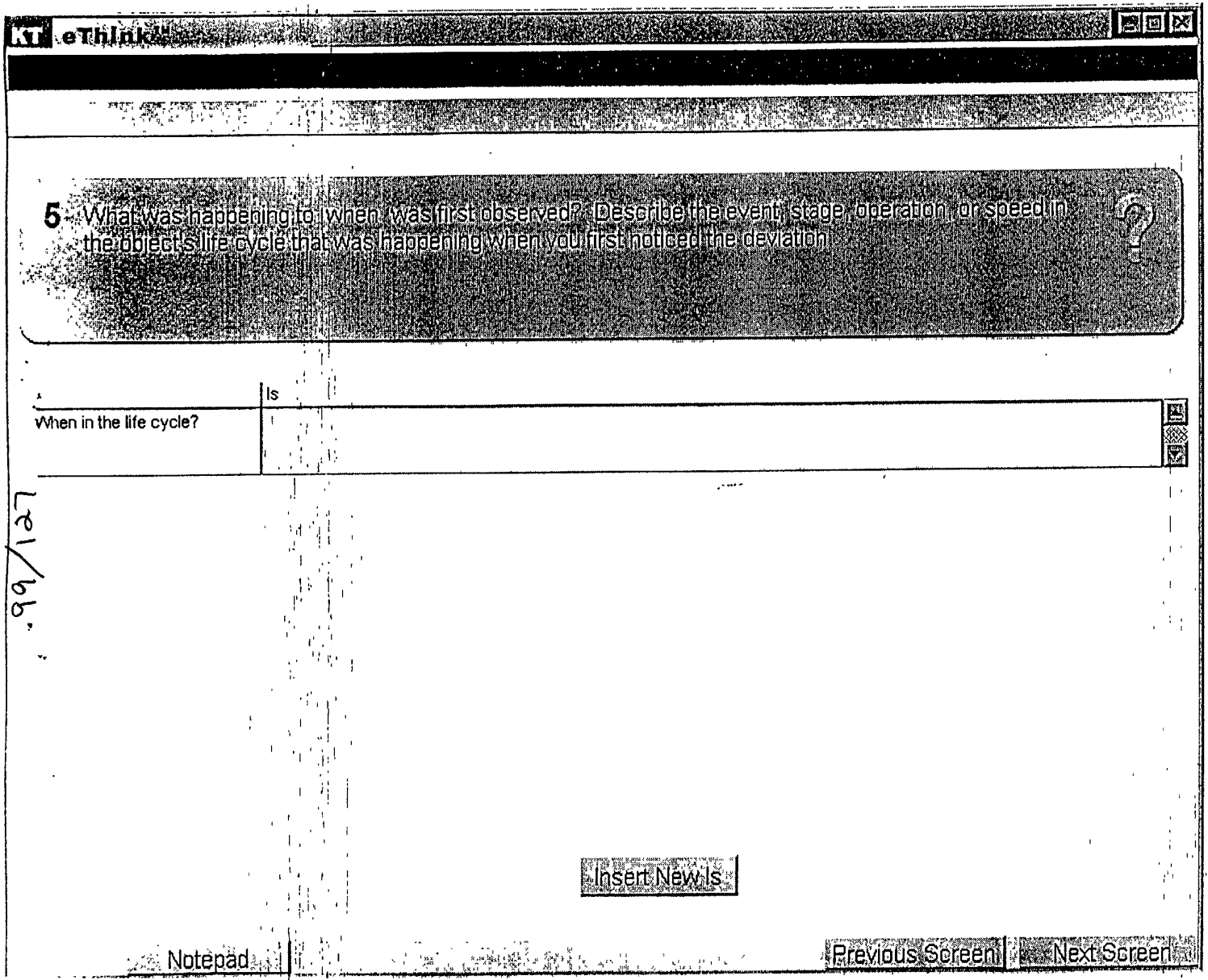

99/127

Fig. 109

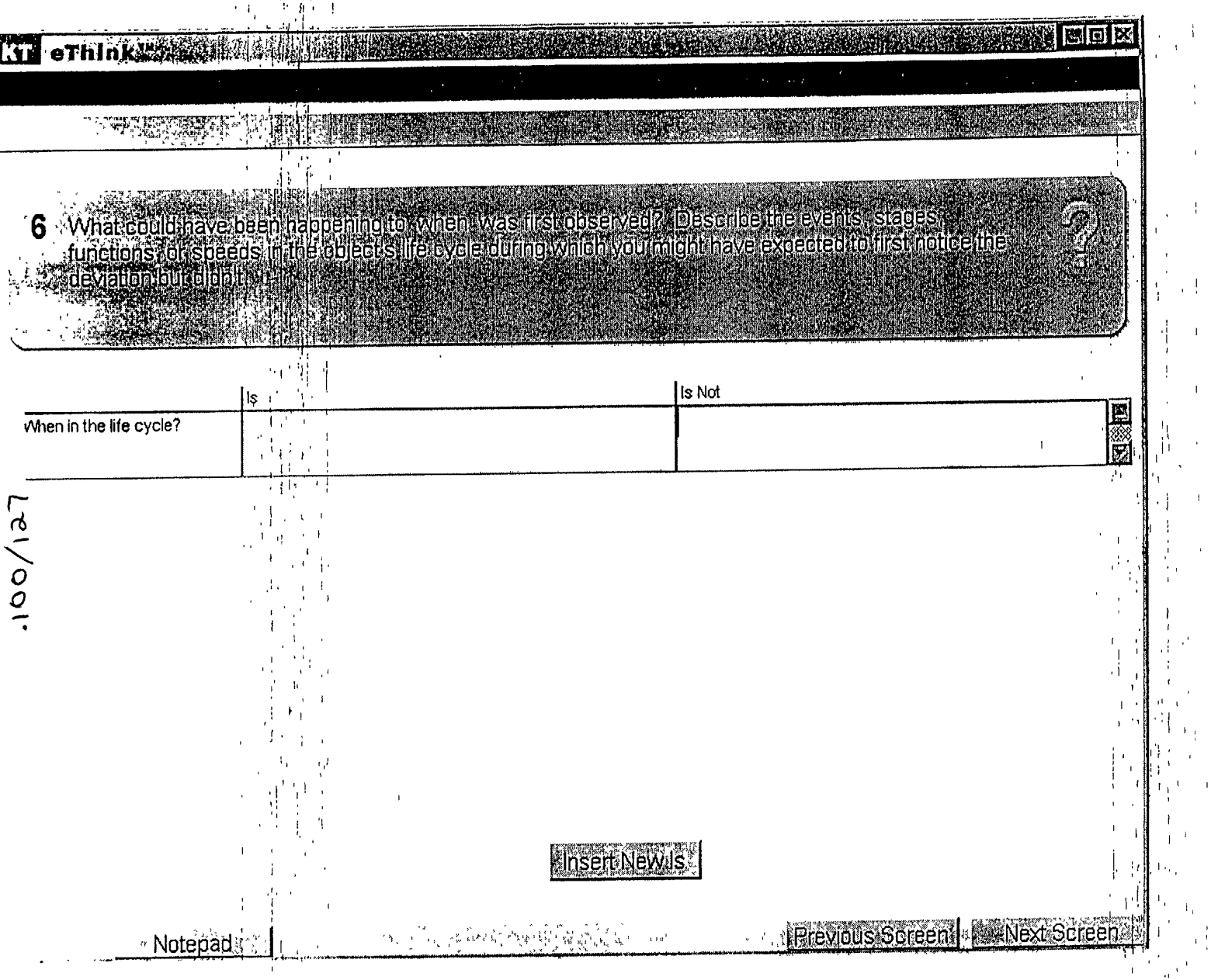

Fig. 110

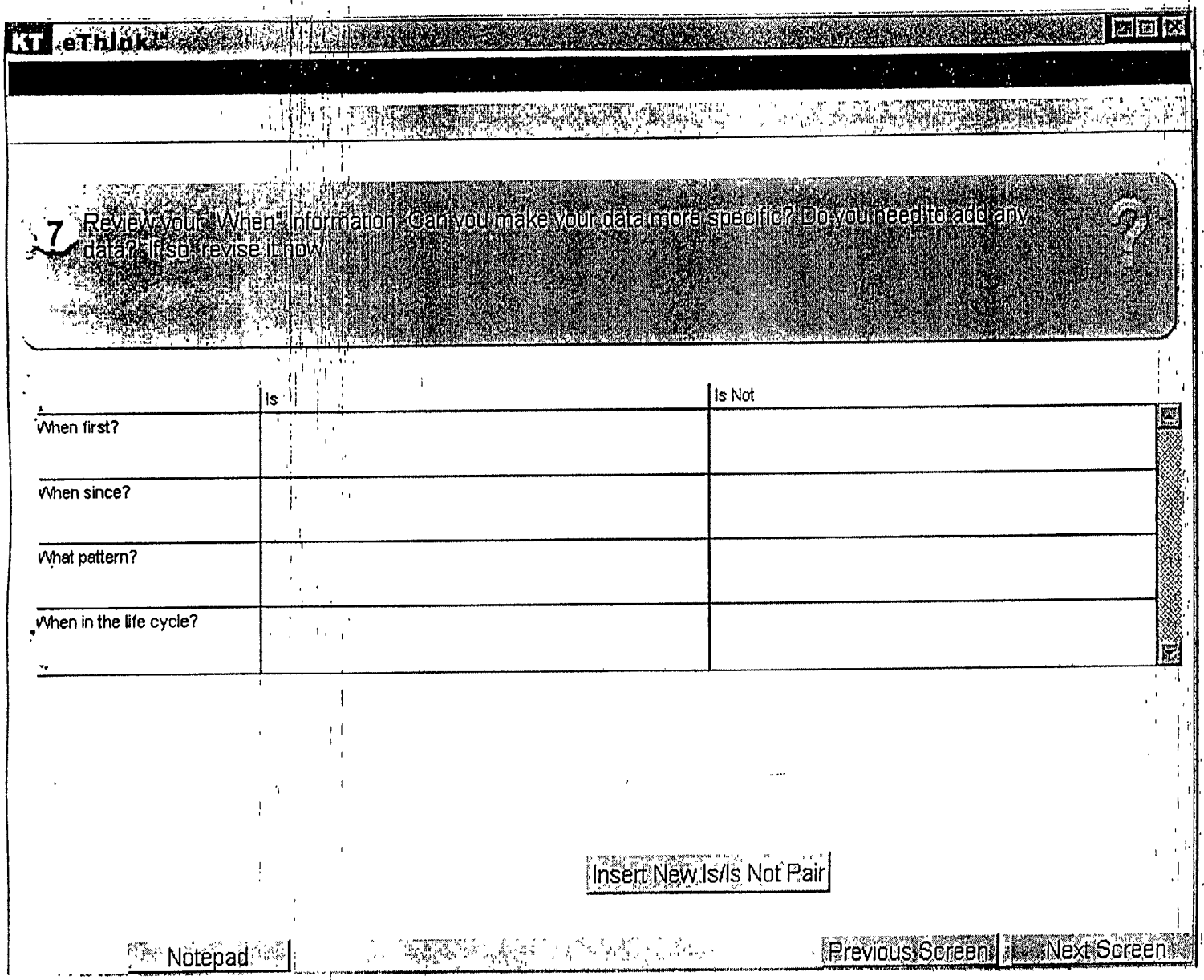
KT eThink!
7 Review your "When" information. Can you make your data more specific? Do you need to add any data? If so, revise it now.
Is
Is Not
When first?
When since?
What pattern?
When in the life cycle?
Insert New Is/Is Not Pair
Notepad
Previous Screen
Next Screen

Fig. 111

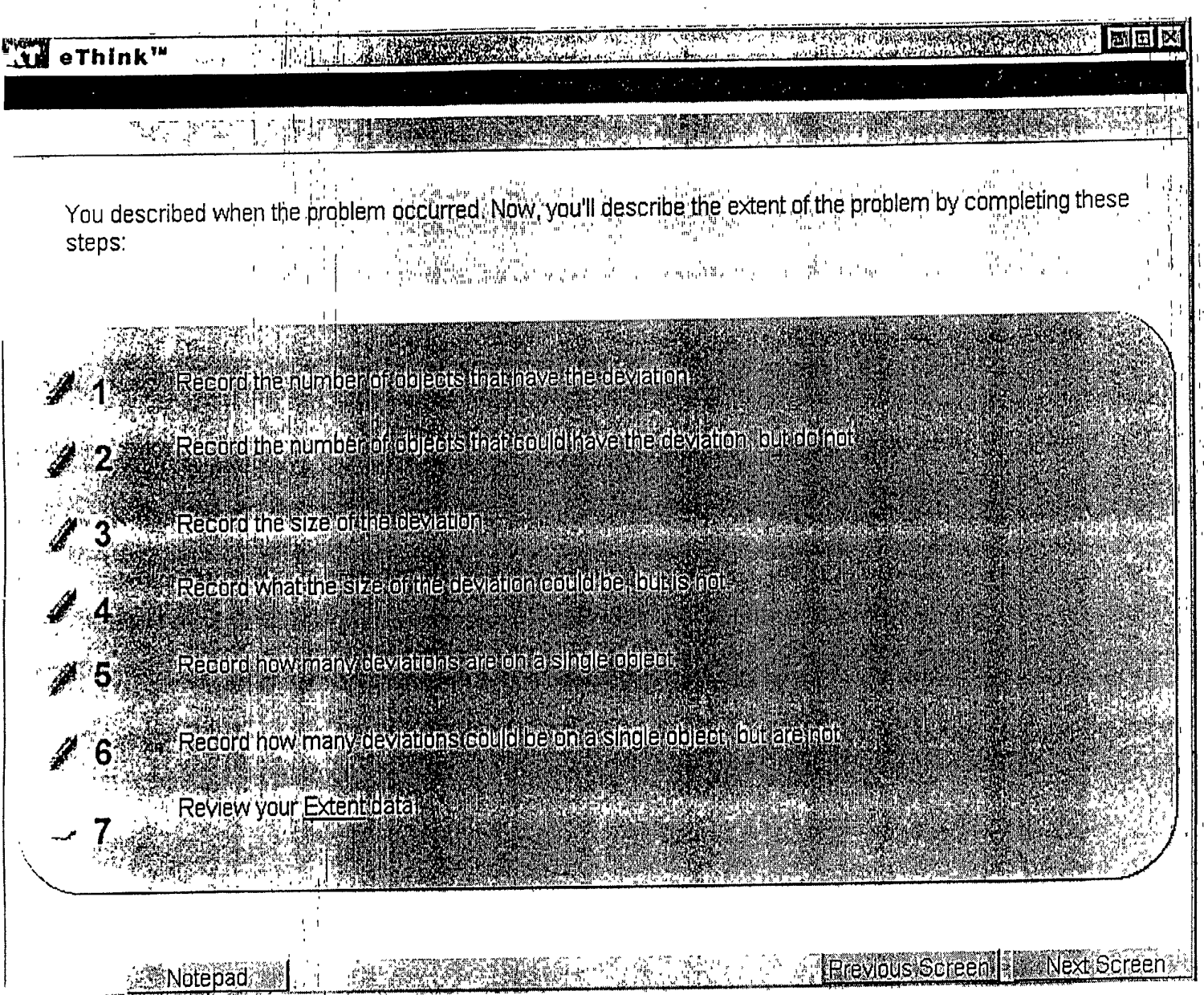

Fig. 112

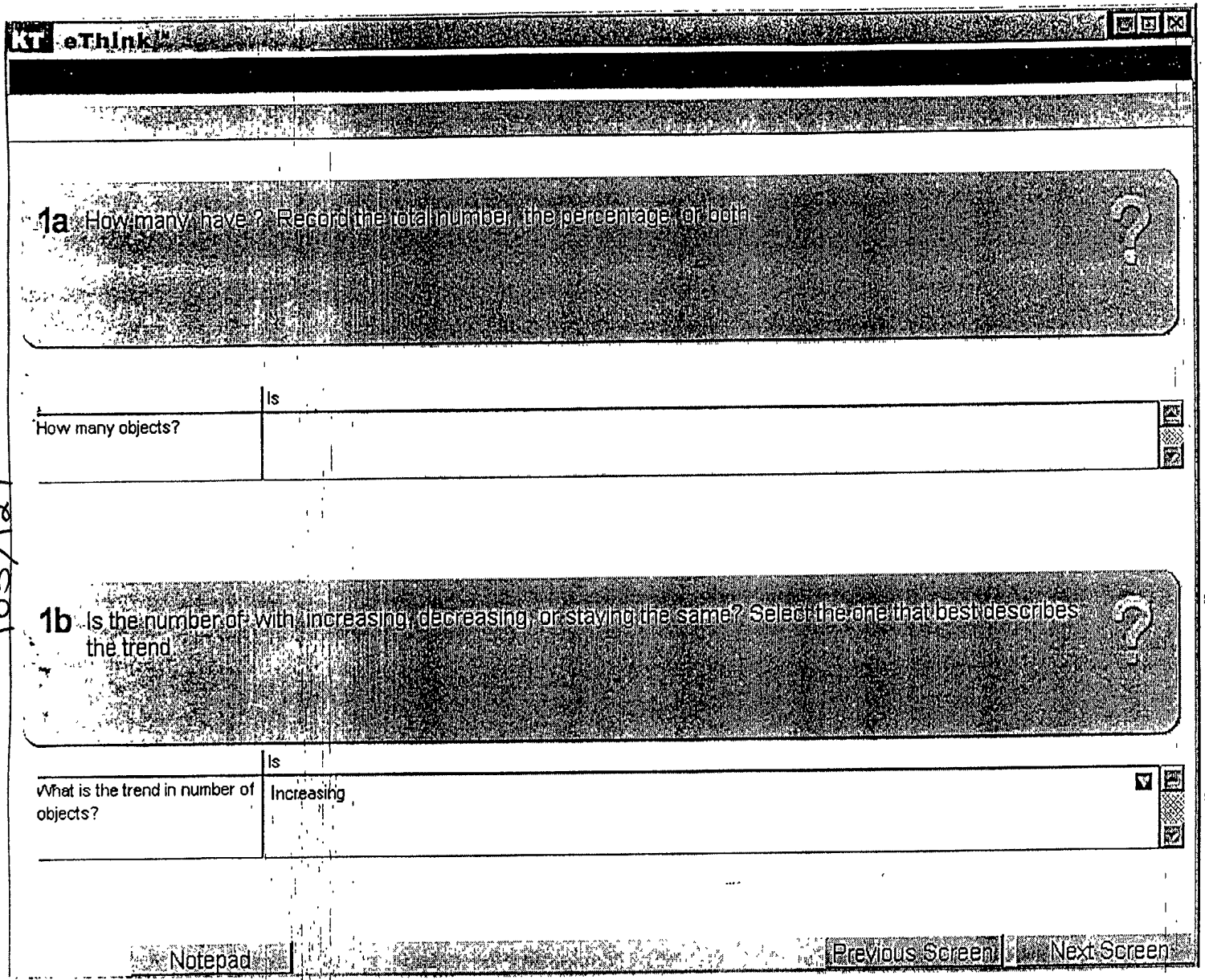
eThink
1a How many have? Record the total number, the percentage, or both
Is
How many objects?
1b Is the number of with increasing, decreasing, or staying the same? Select the one that best describes the trend
Is
What is the trend in number of objects?
Increasing
Notepad
Previous Screen
Next Screen

Fig. 113

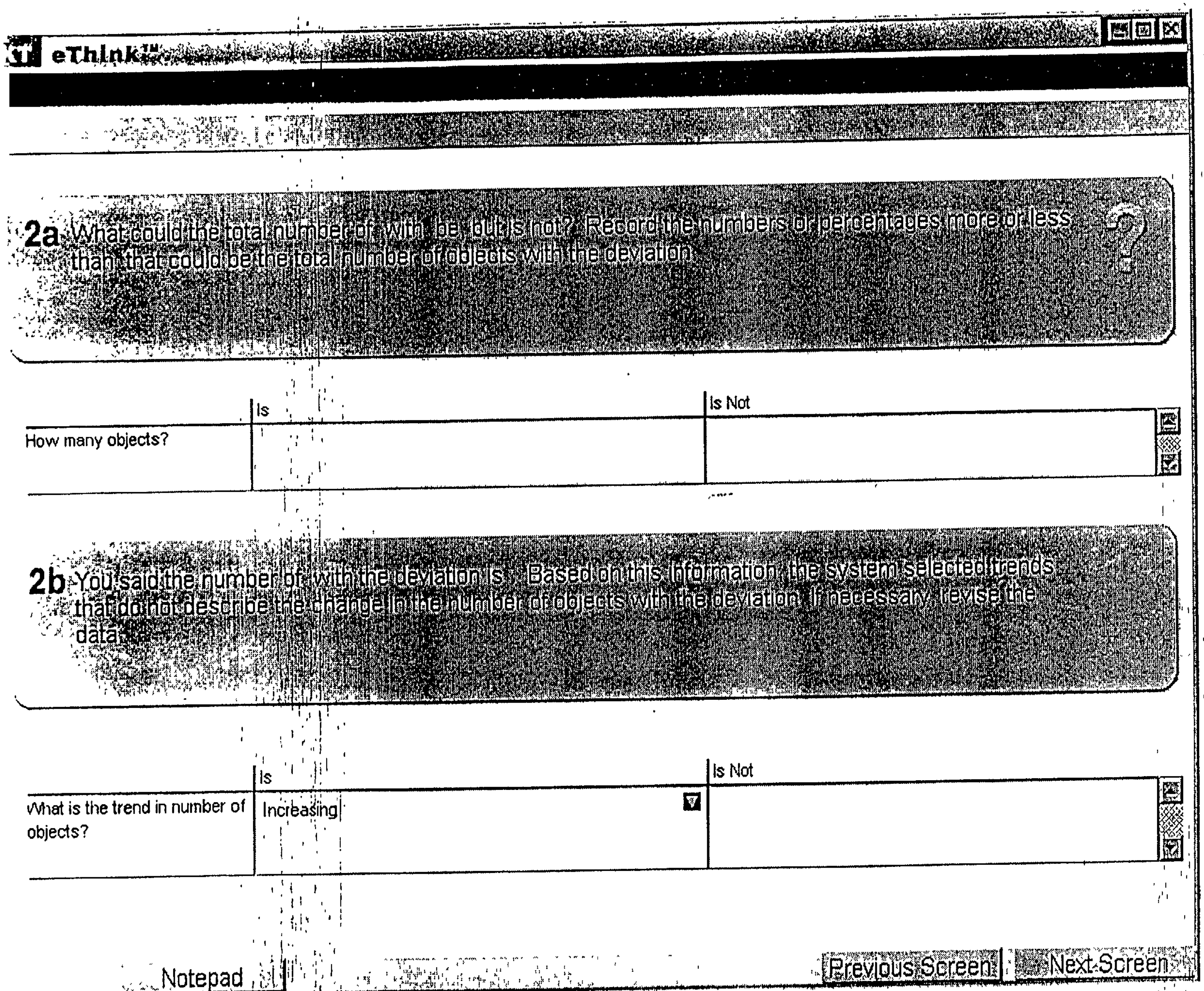
eThink™
2a What could the total number of with be, but is not? Record the numbers or percentages more or less than that could be the total number of objects with the deviation.
Is
Is Not
How many objects?
2b You said the number of with the deviation is . Based on this information, the system selected trends that do not describe the change in the number of objects with the deviation. If necessary, revise the data.
Is
Is Not
What is the trend in number of objects?
Increasing
Notepad
Previous Screen
Next Screen

Fig. 114

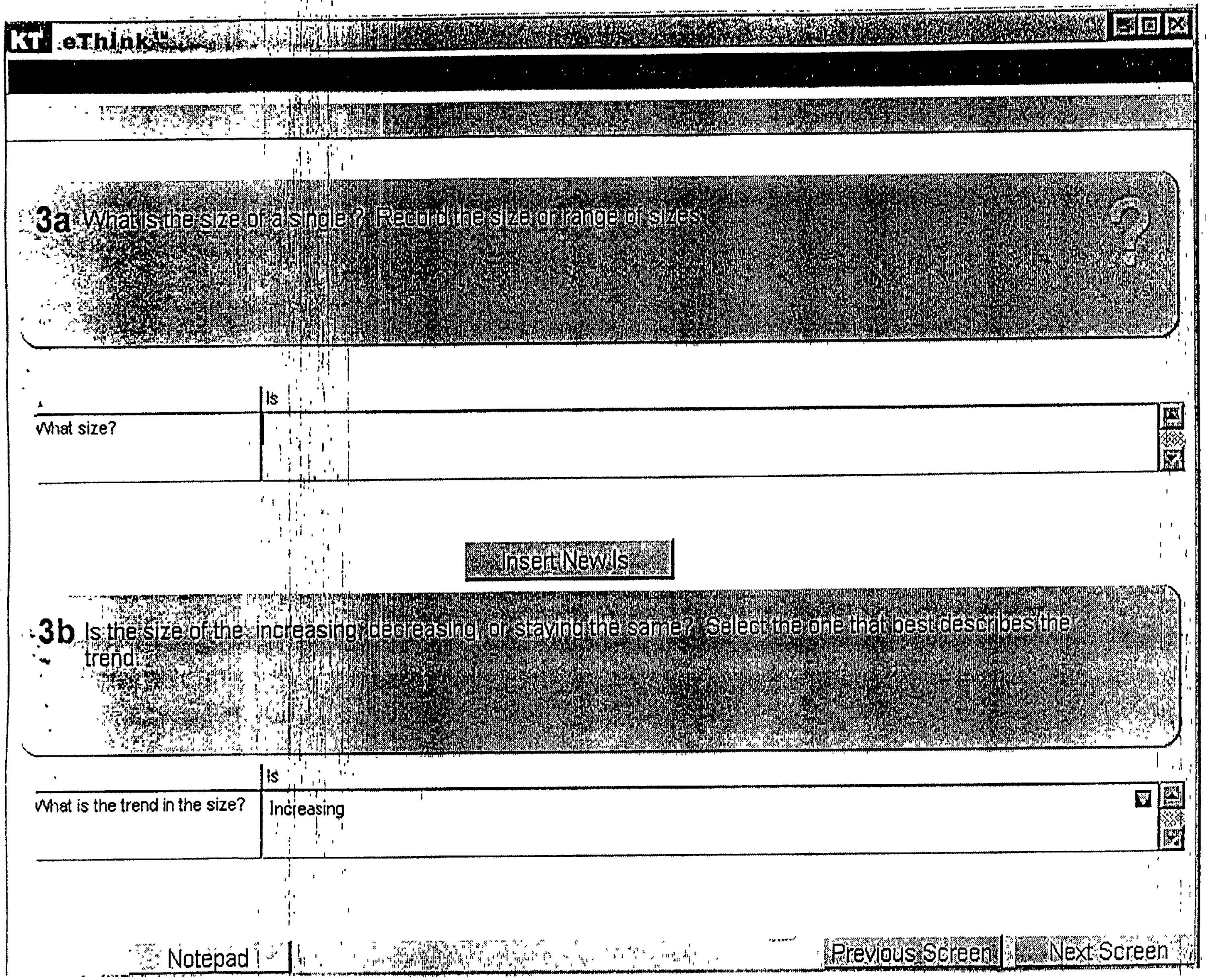
KT eThink
3a What is the size of a single ? Record the size or range of sizes.
Is
What size?
Insert New Is
3b Is the size of the increasing, decreasing, or staying the same? Select the one that best describes the trend.
Is
What is the trend in the size?
Increasing
Notepad
Previous Screen
Next Screen

Fig. 115

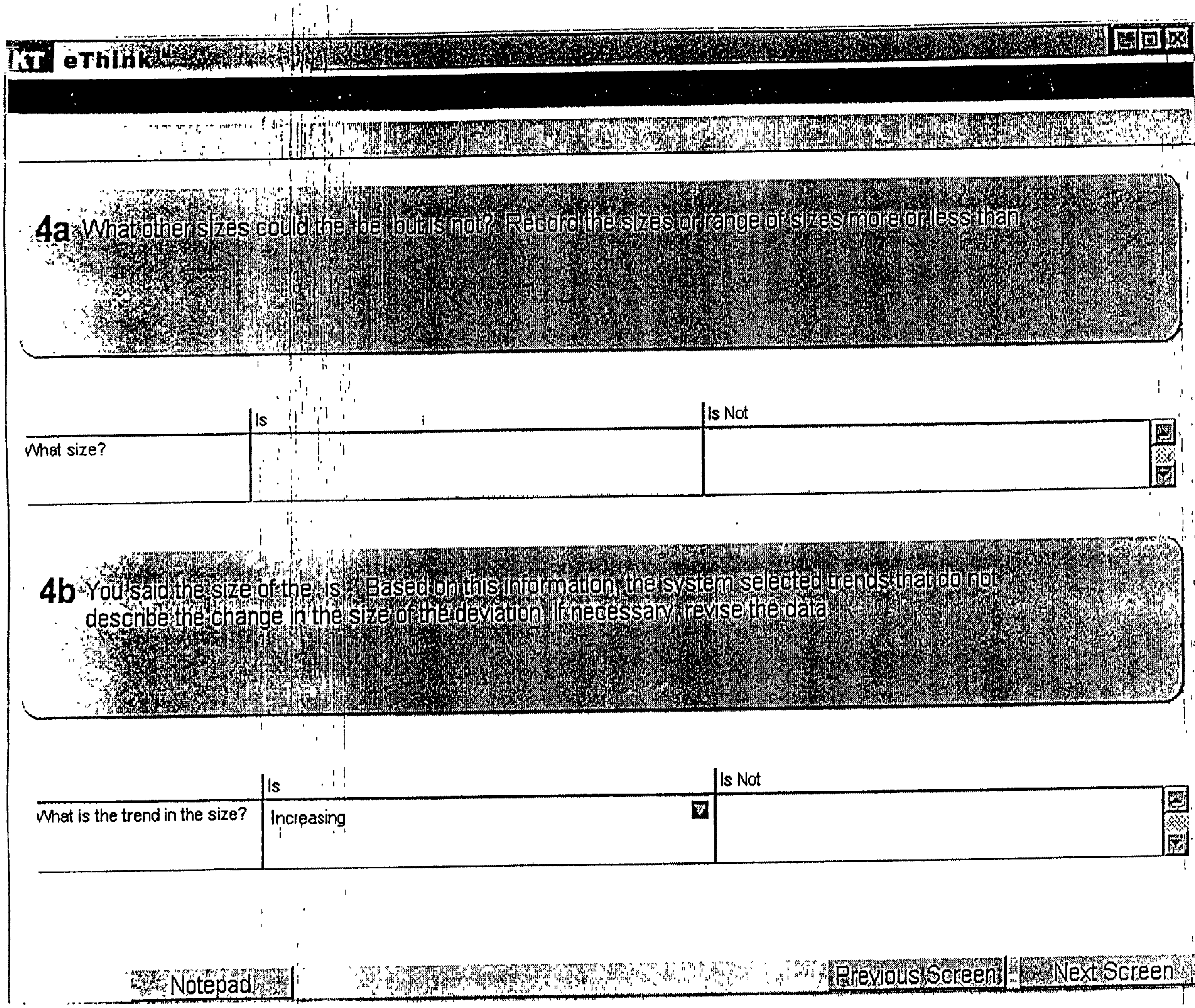

Fig. 116

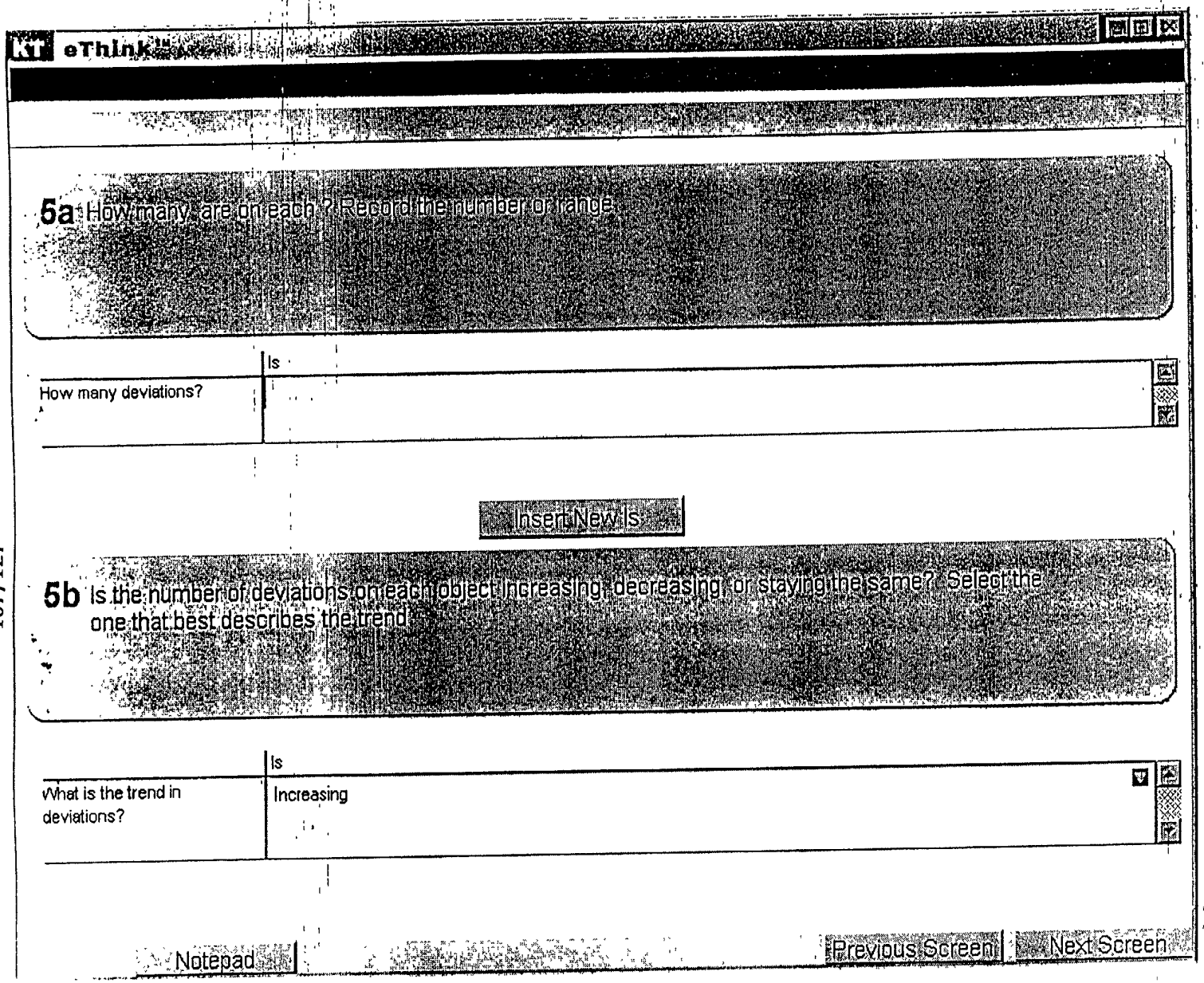

Fig. 117

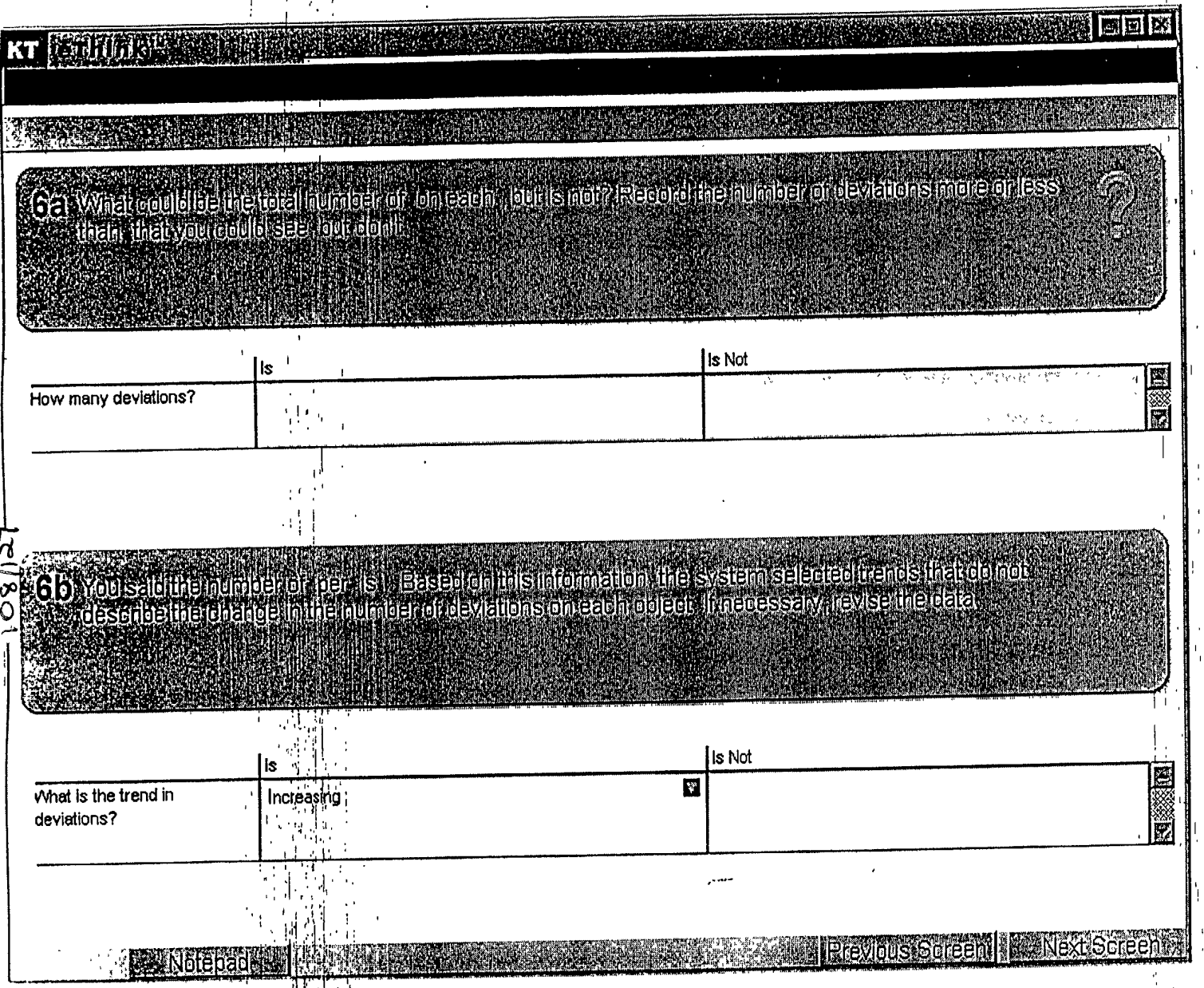

Fig. 118

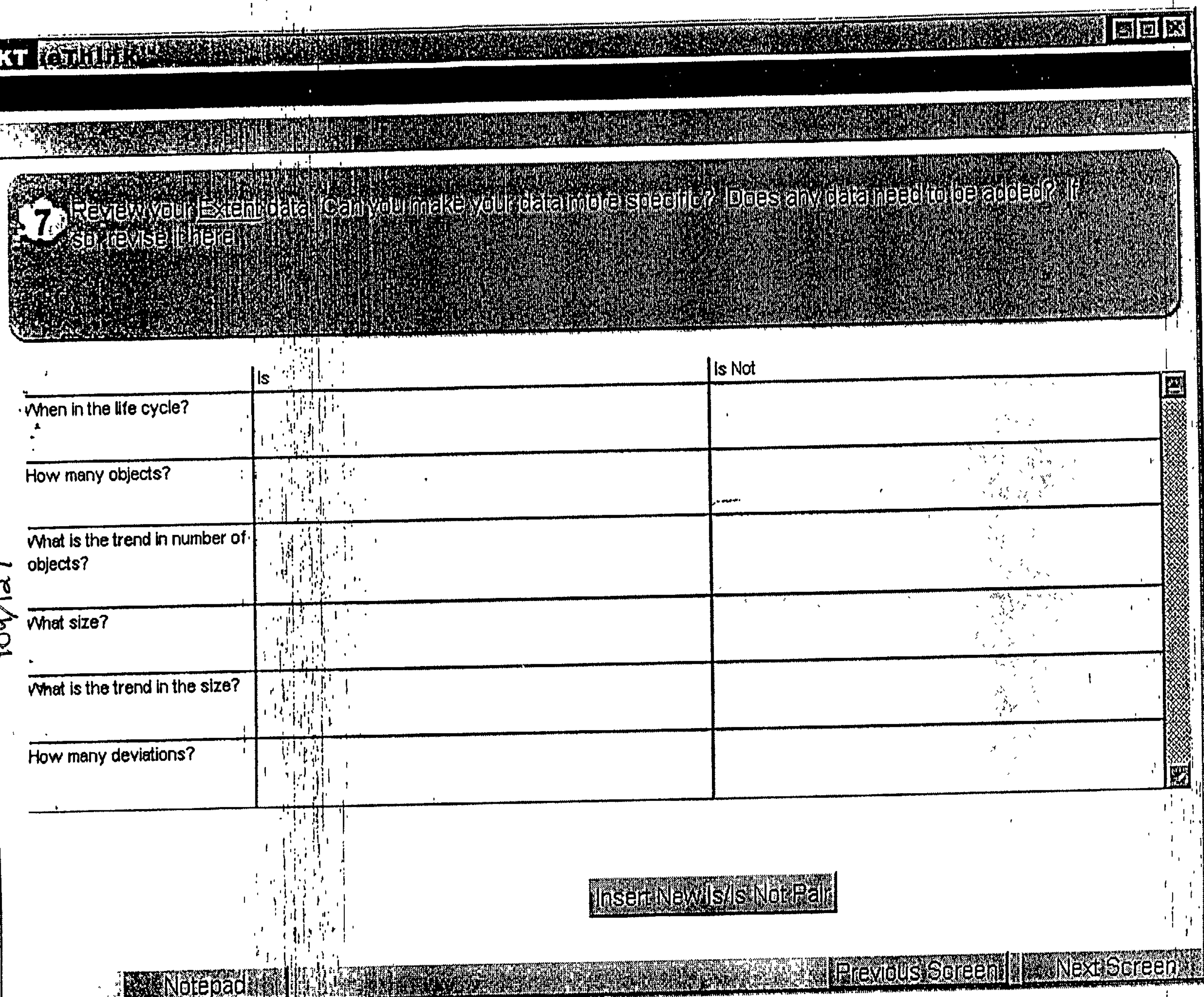

Fig. 119

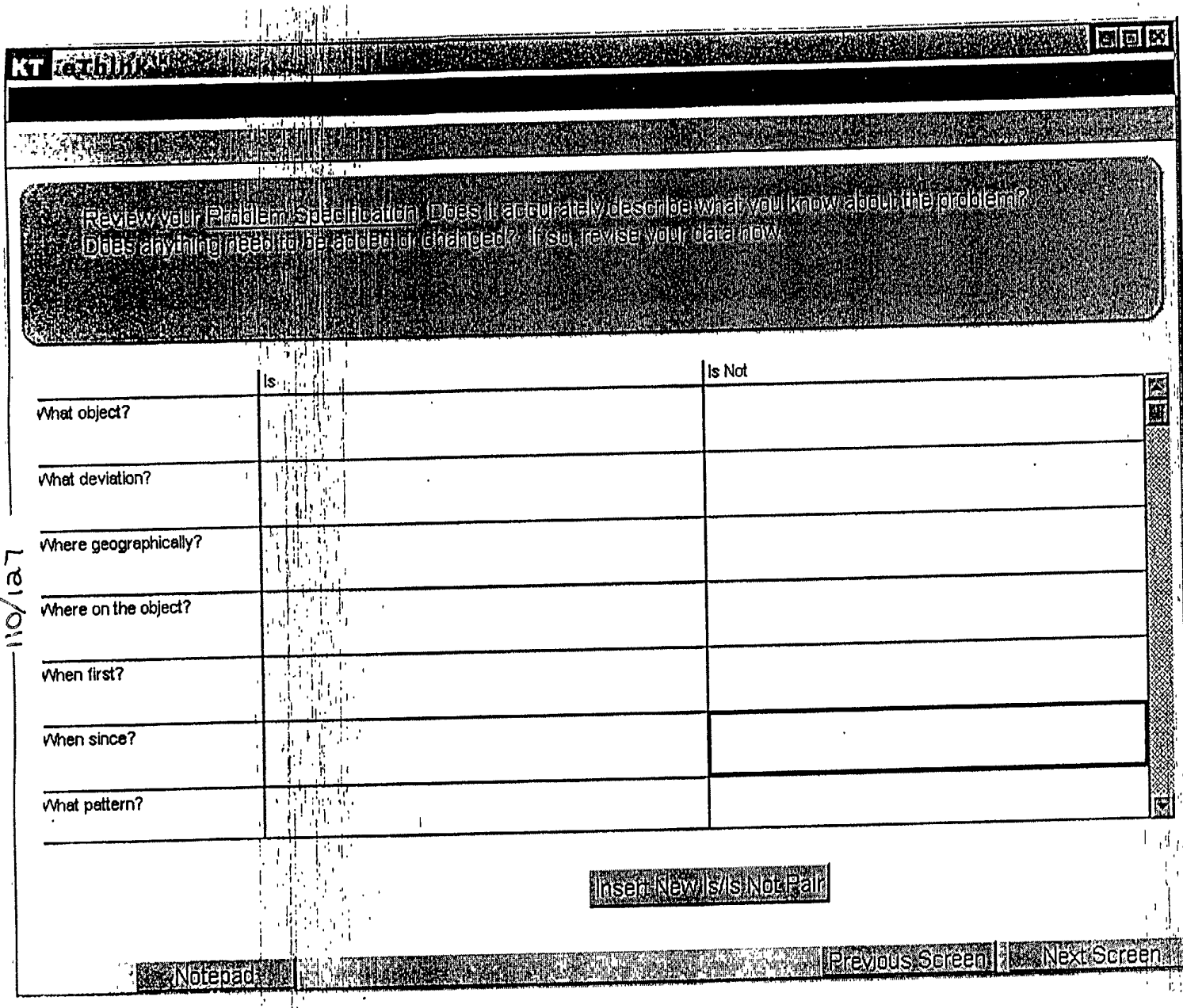

Fig. 120

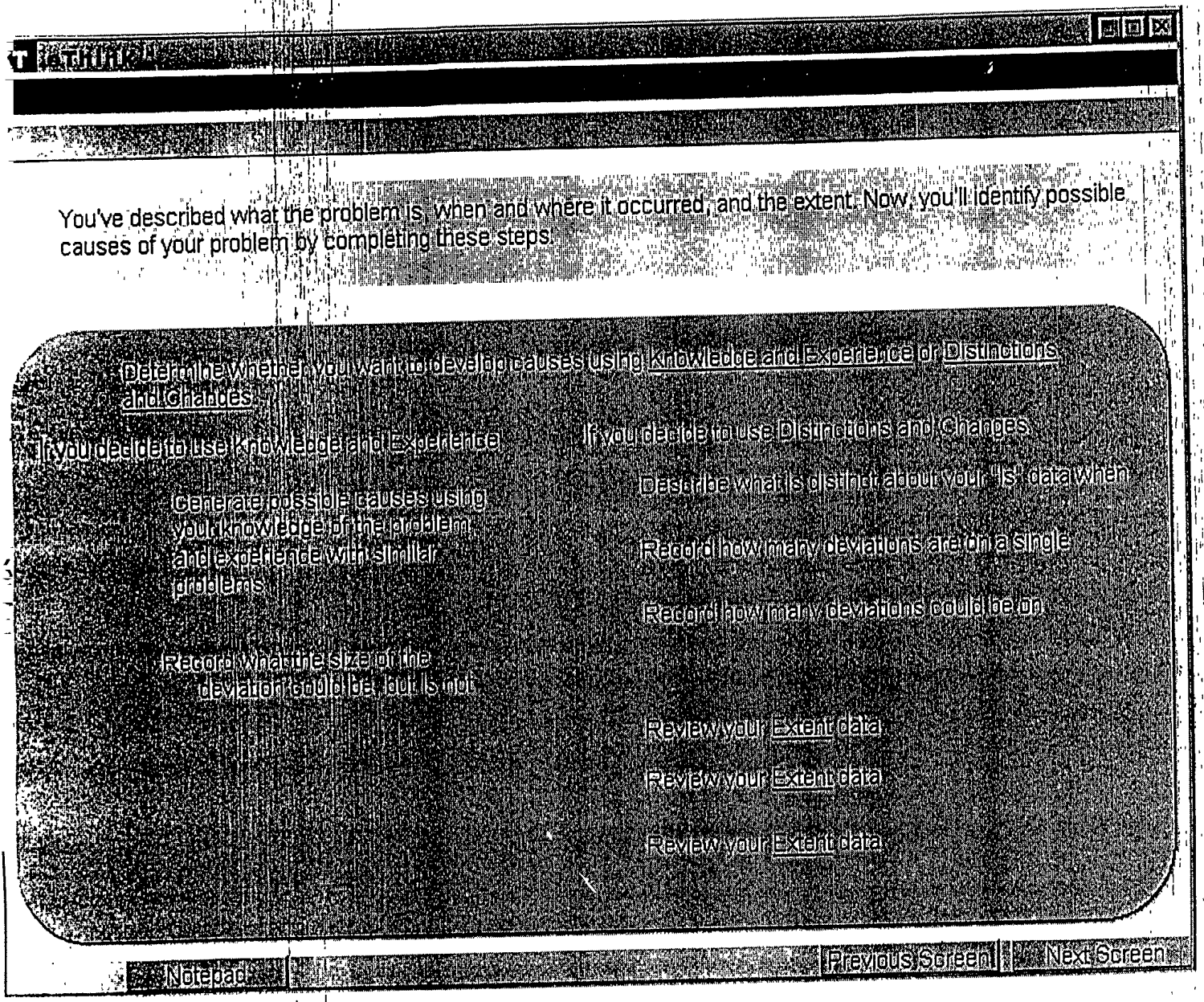

Fig. 121

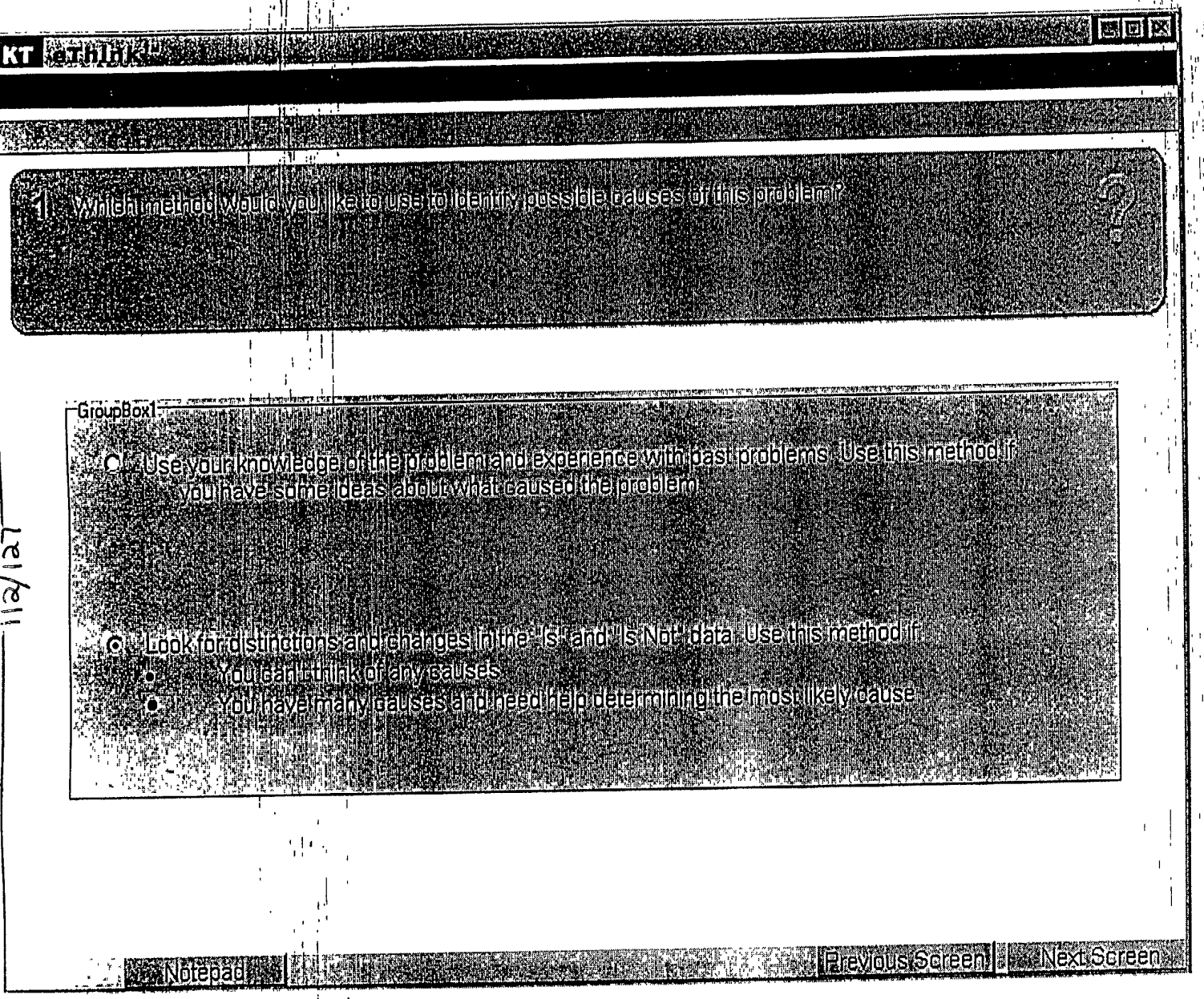

Fig. 122

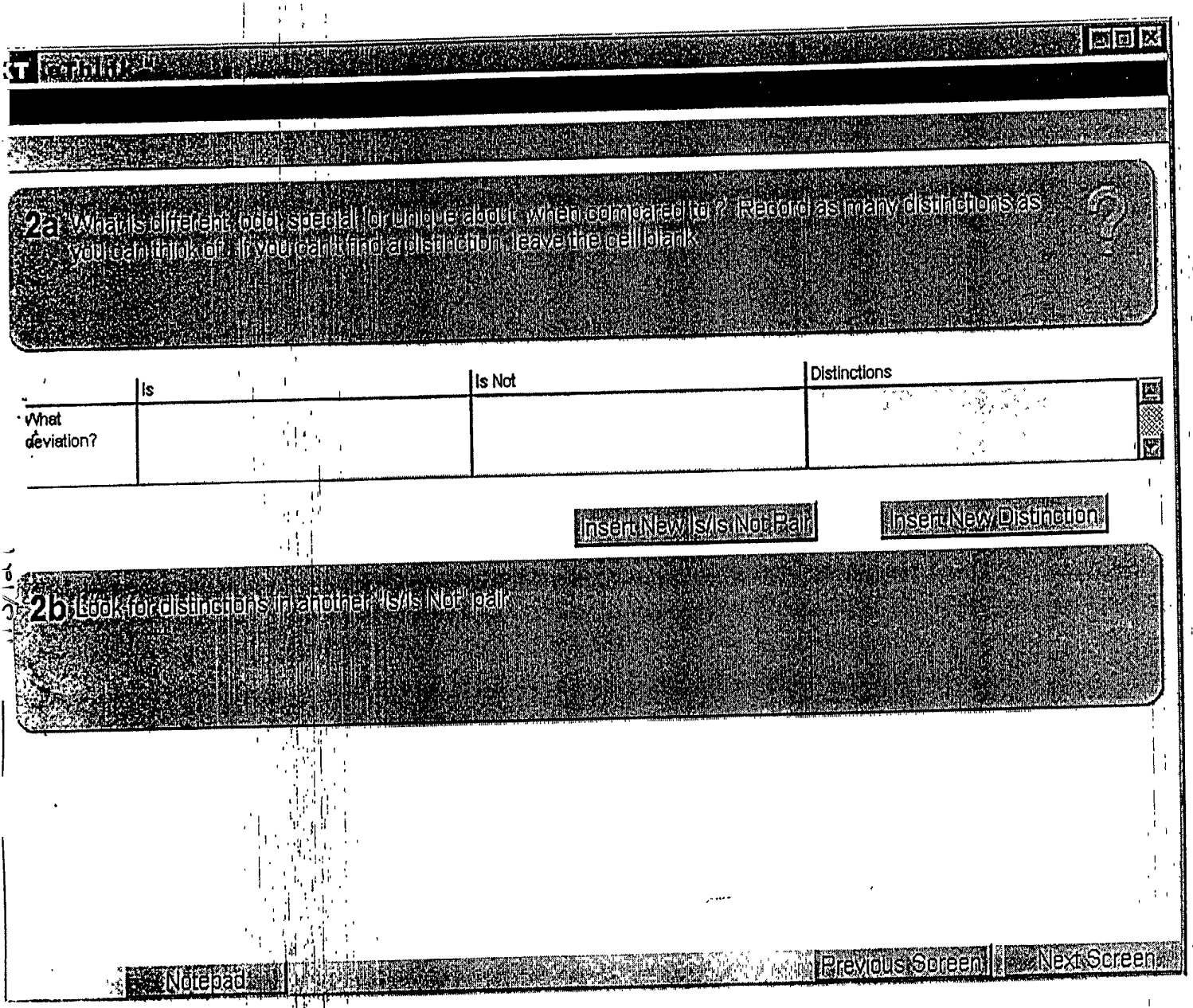

Fig. 123

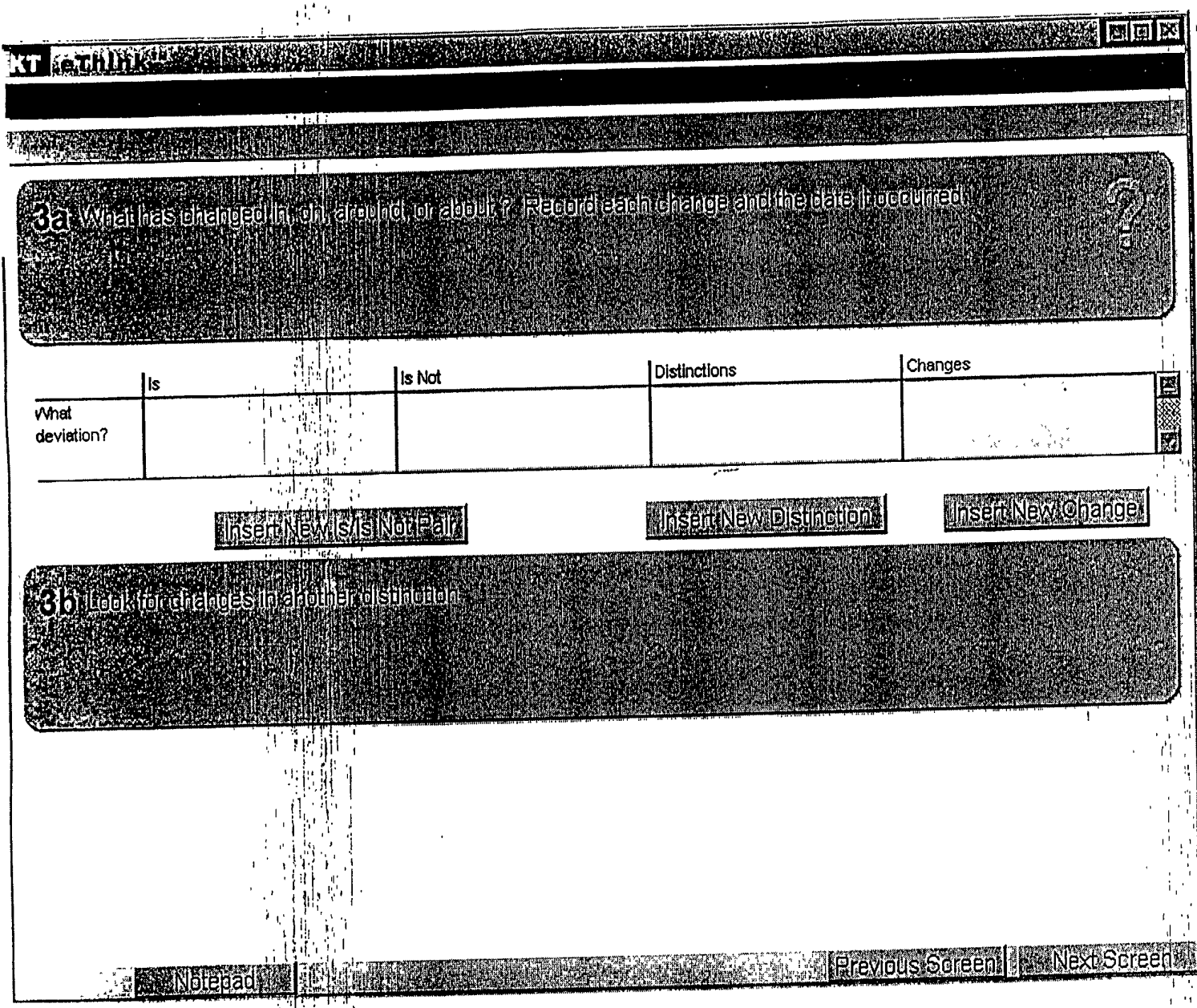
KT
3a What has changed in, on, around, or about ? Record each change and the date it occurred.
Is
Is Not
Distinctions
Changes
What deviation?
Insert New Is/Is Not Pair
Insert New Distinction
Insert New Change
3b Look for changes in another distinction
Notepad
Previous Screen
Next Screen

Fig. 124

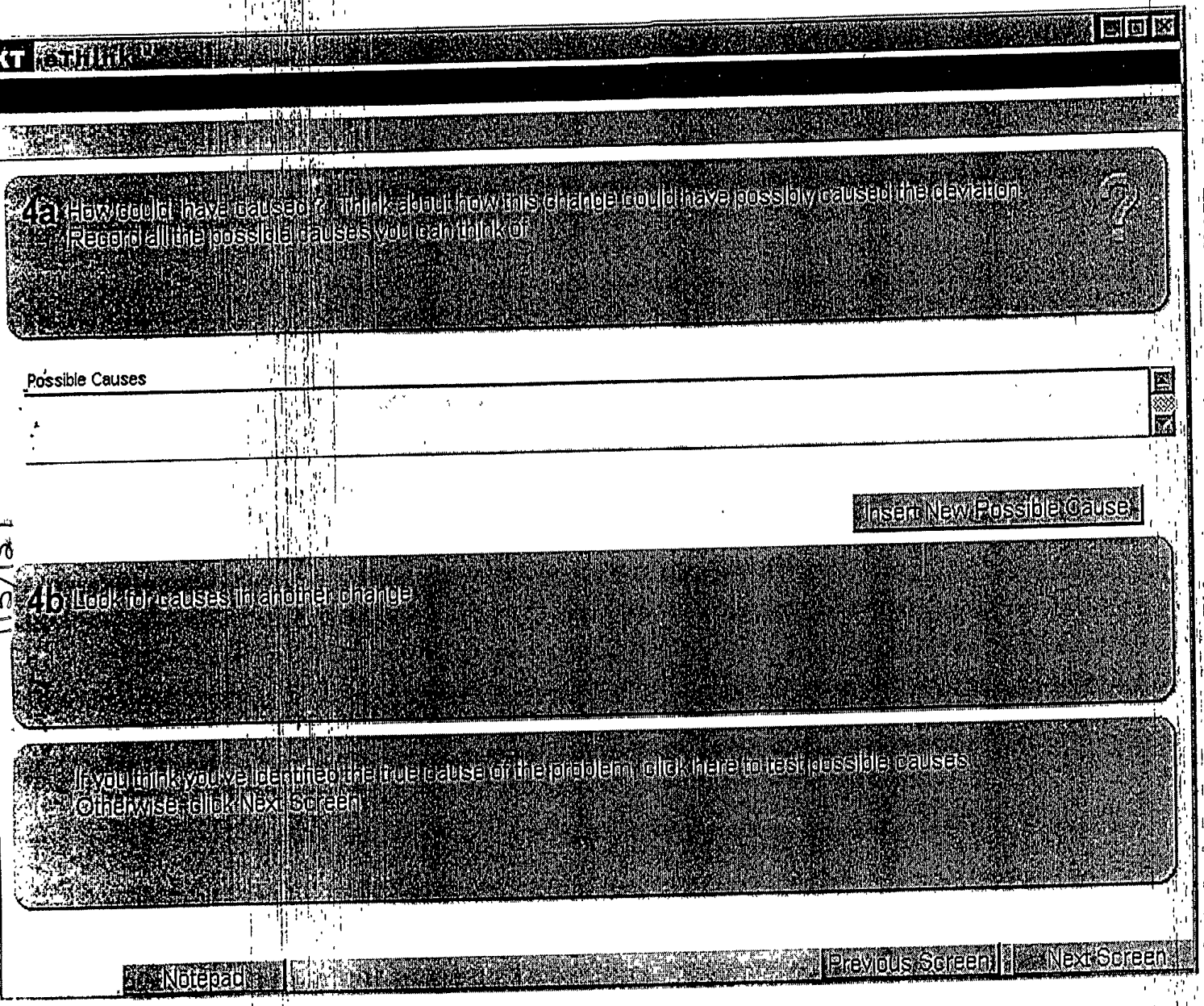

Fig. 125

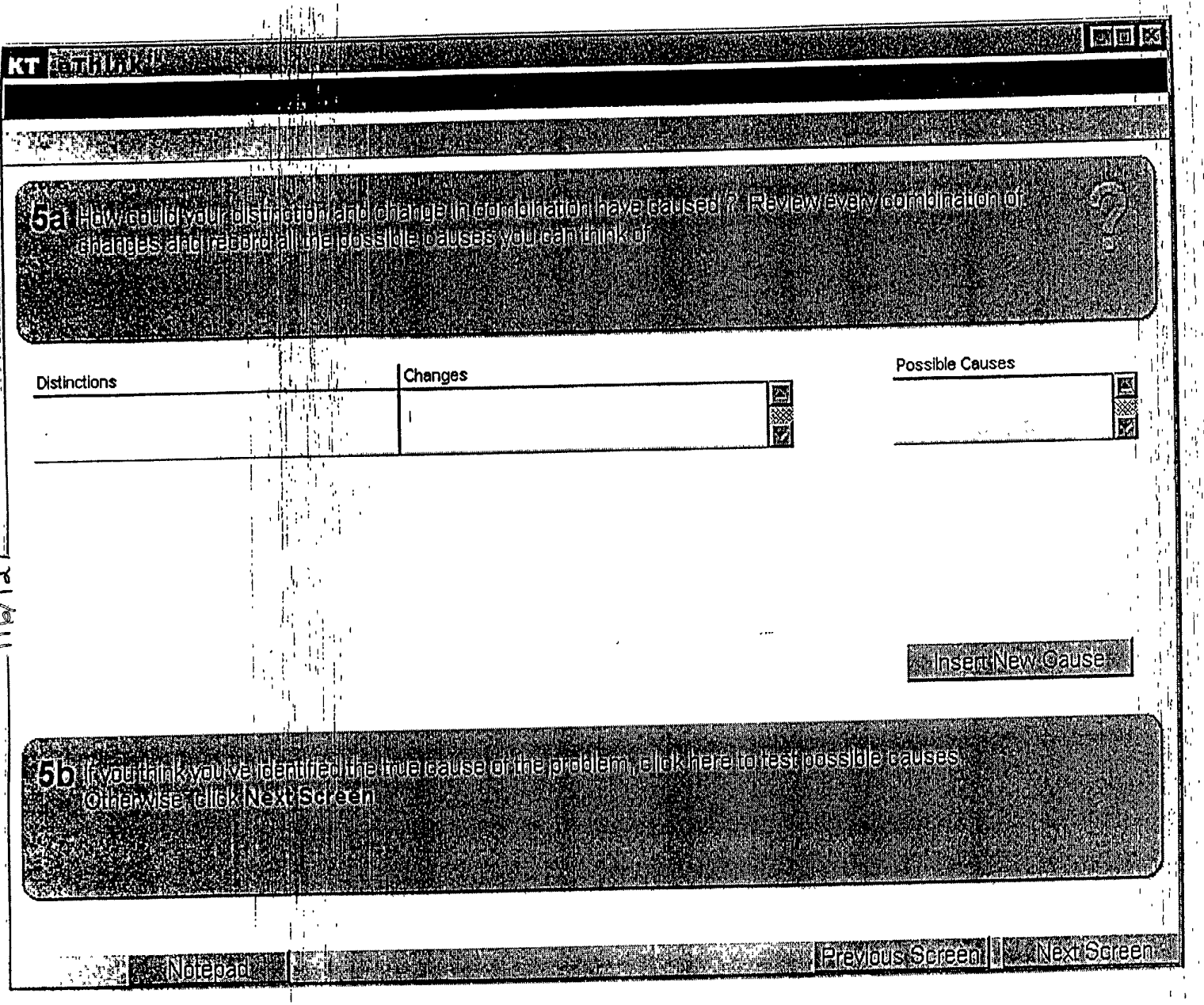

Fig. 126

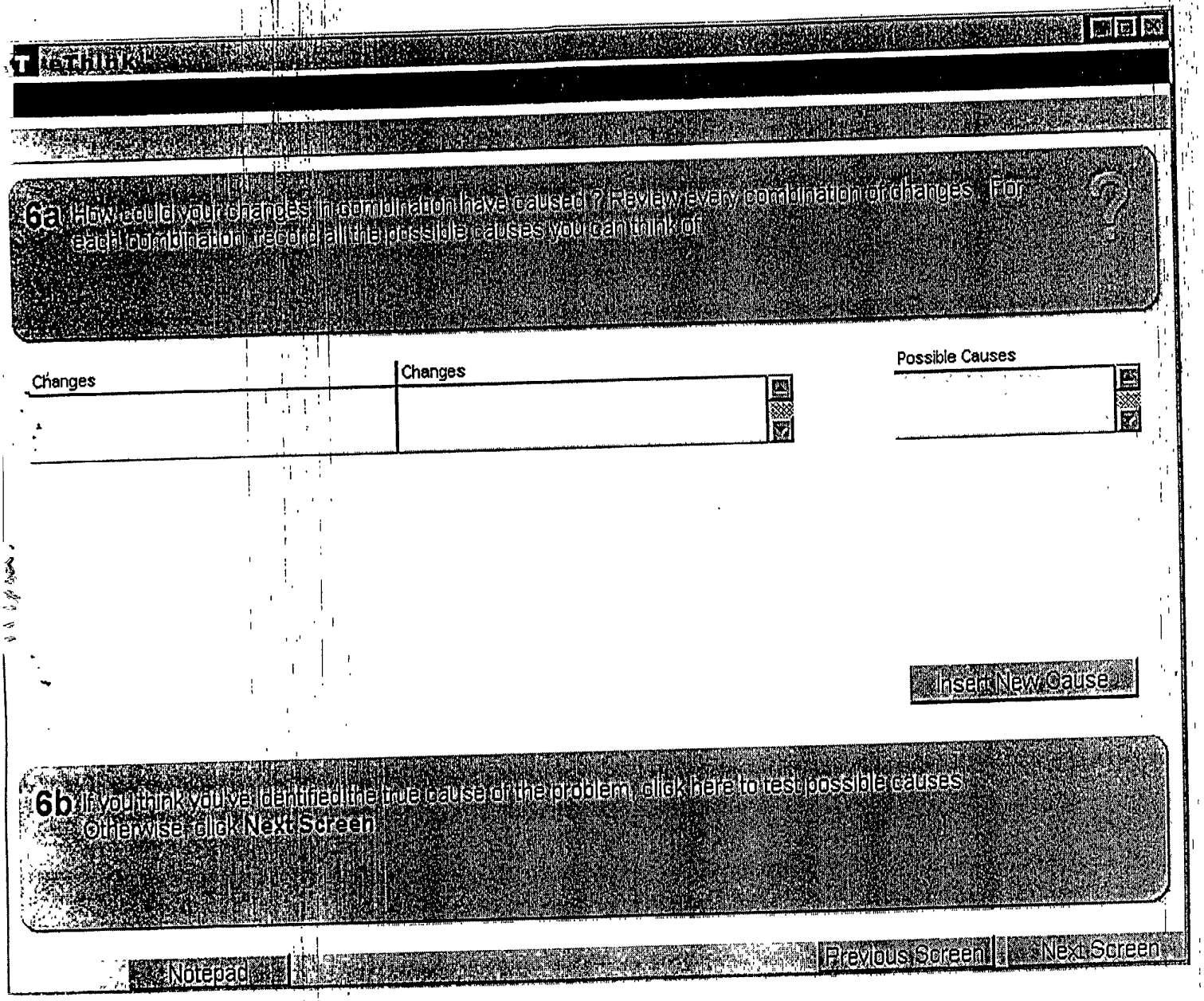

Fig. 127

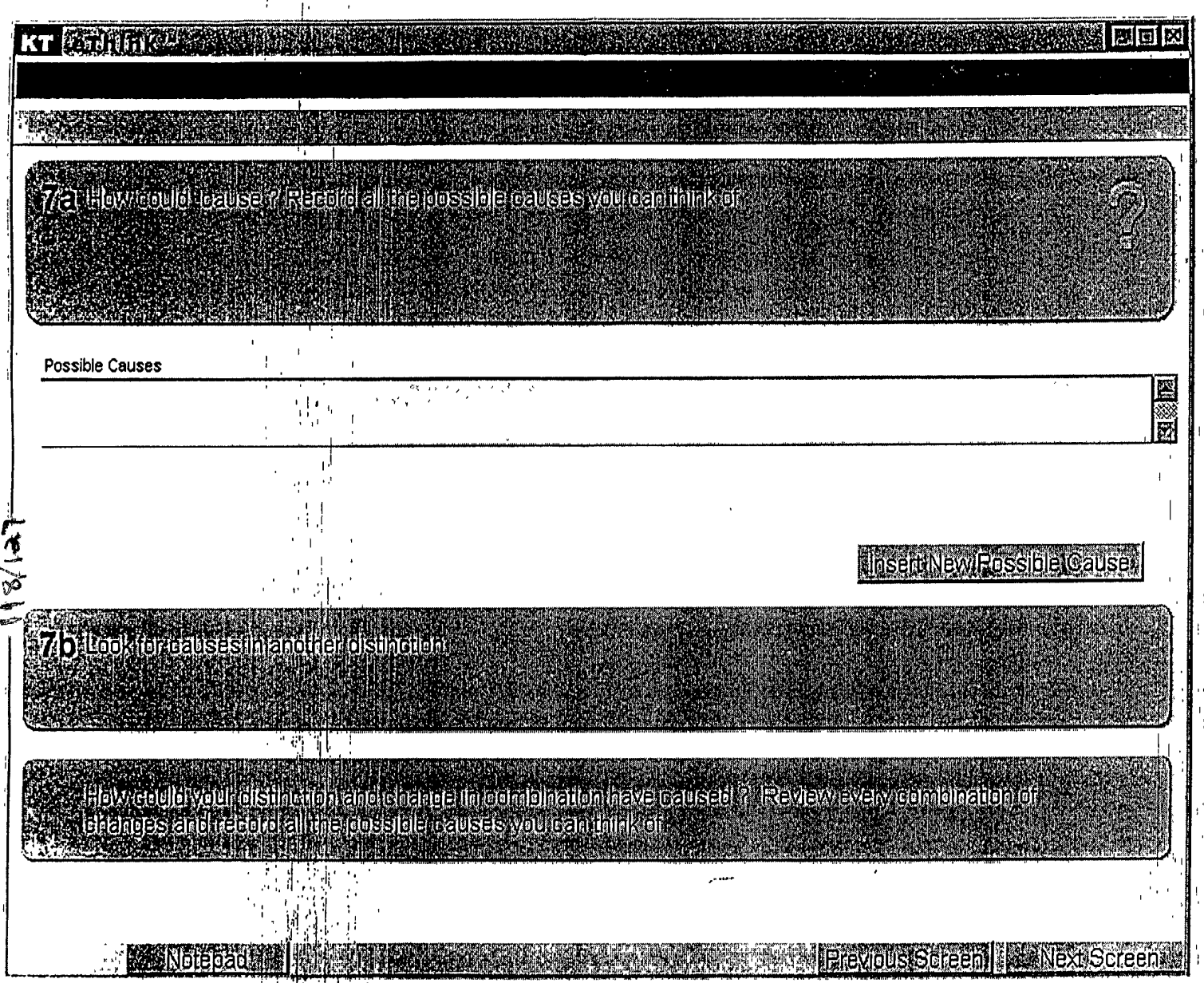
KT
7a How could cause? Record all the possible causes you can think of
Possible Causes
Insert New Possible Cause
7b Look for causes in another distinction
How could your distinction and change in combination have caused ? Review every combination of changes and record all the possible causes you can think of
Notepad
Previous Screen
Next Screen

Fig. 128

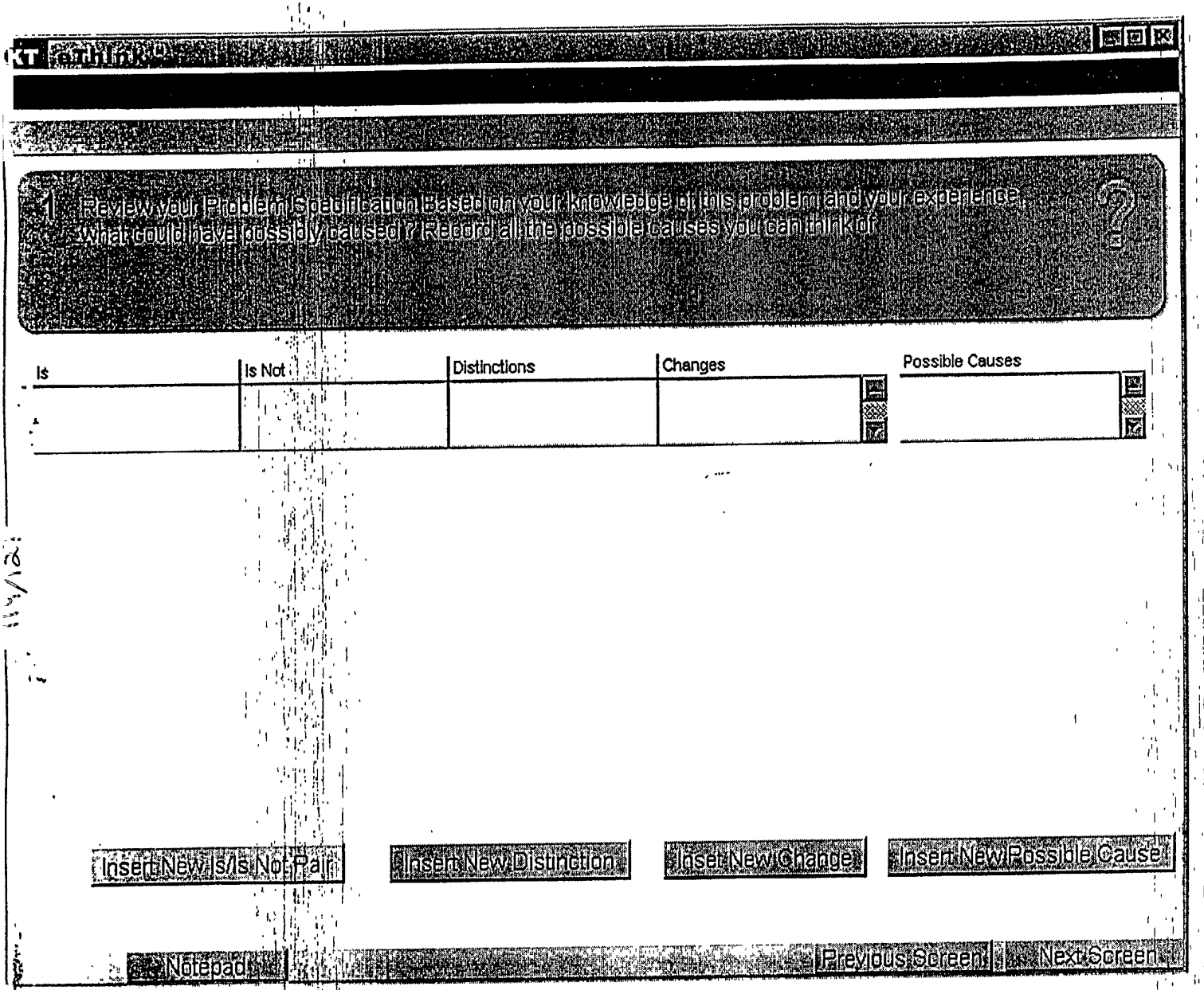

Fig. 129

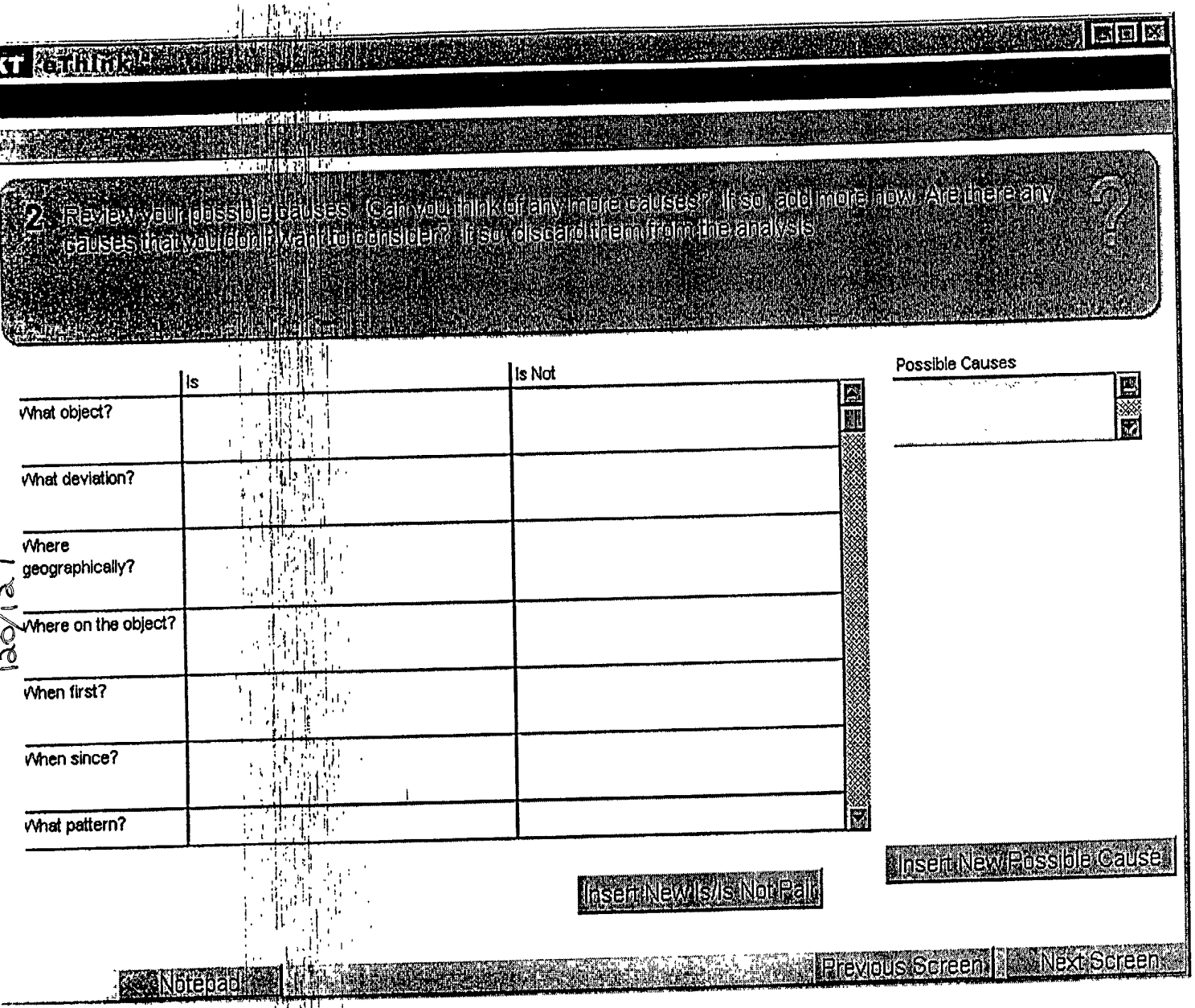

Fig. 130

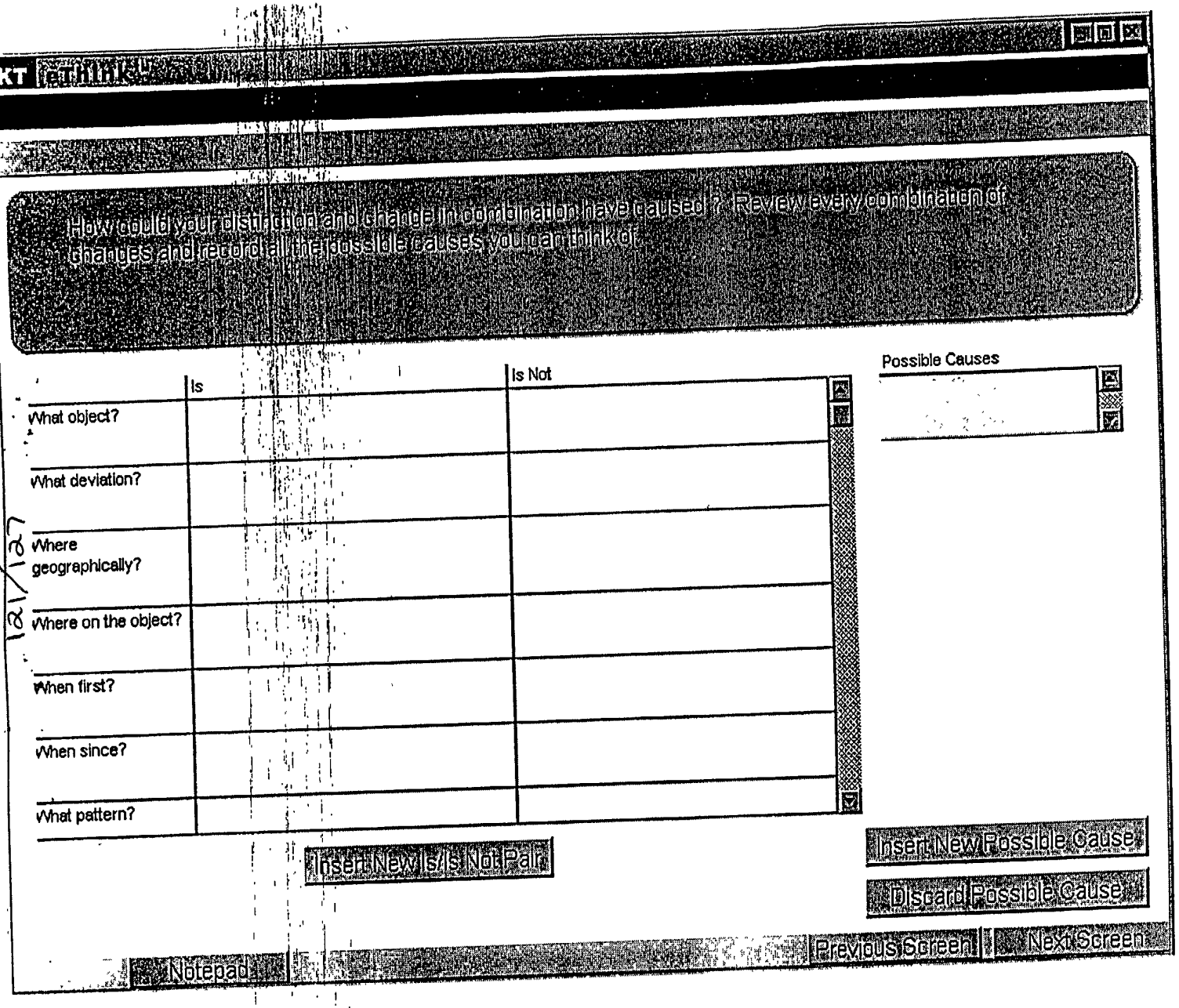

Fig. 131

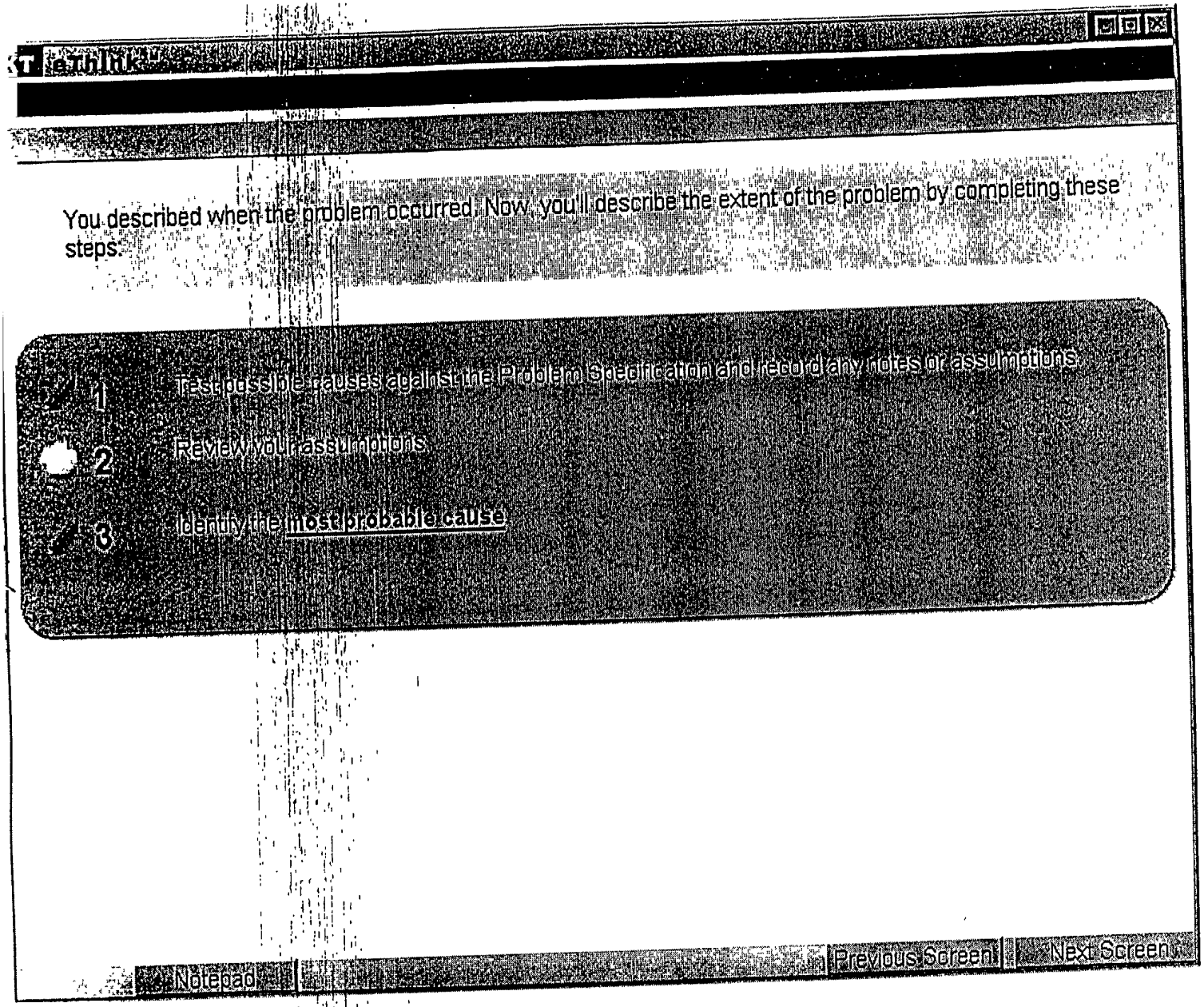

Fig. 132

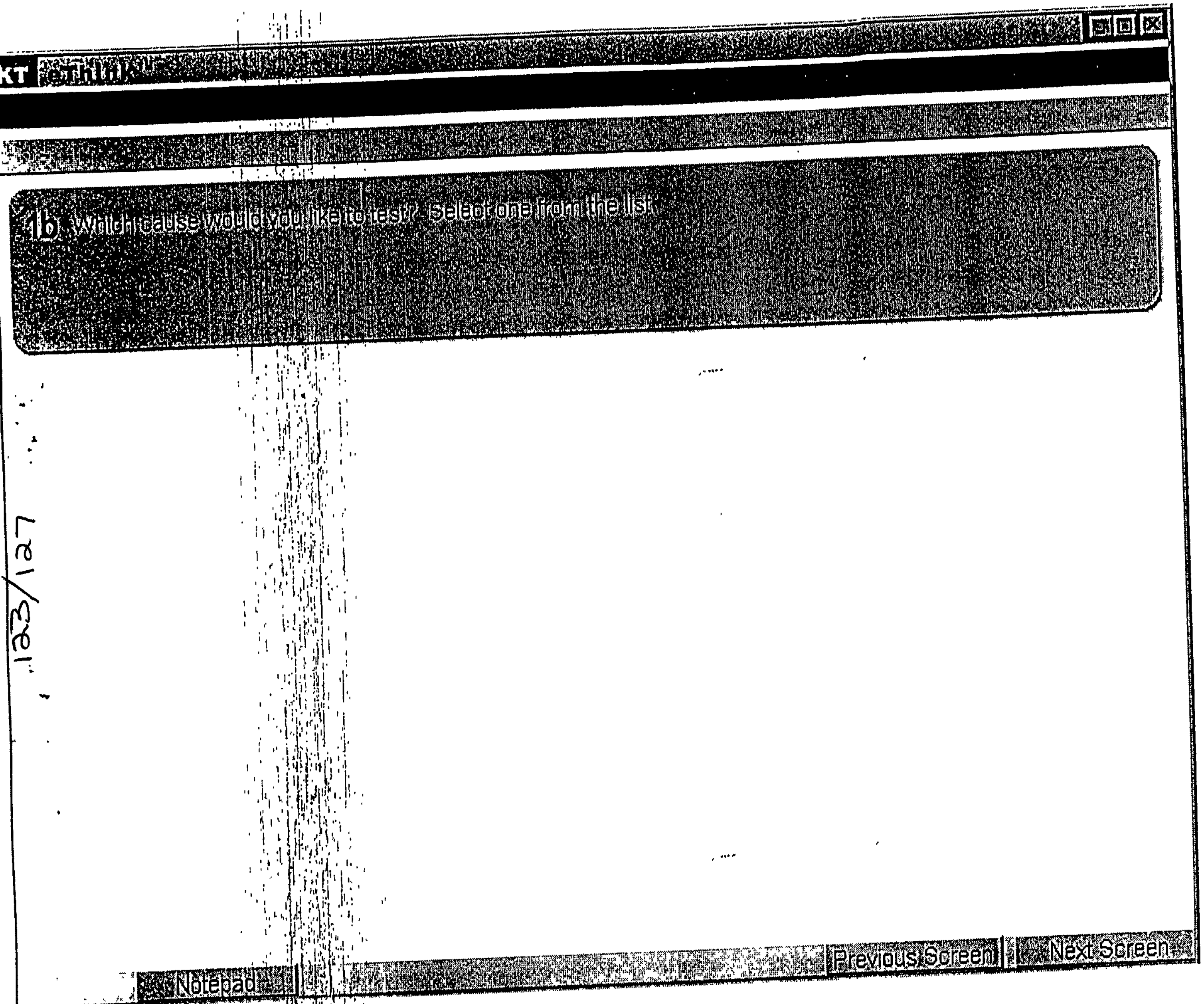
KT eThink
1b. Which cause would you like to test? Select one from the list.
Notepad
Previous Screen
Next Screen

Fig. 133

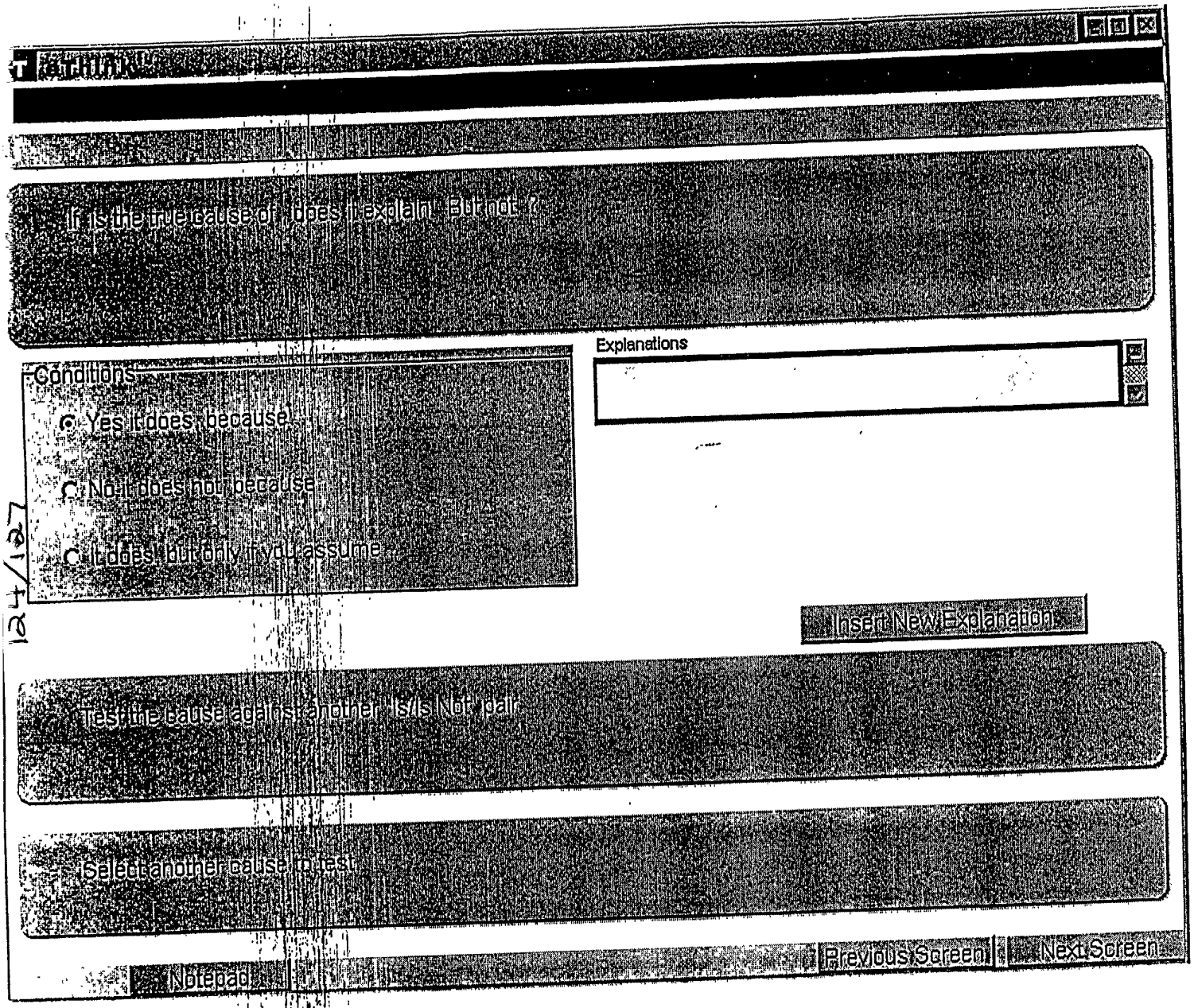

Fig. 134

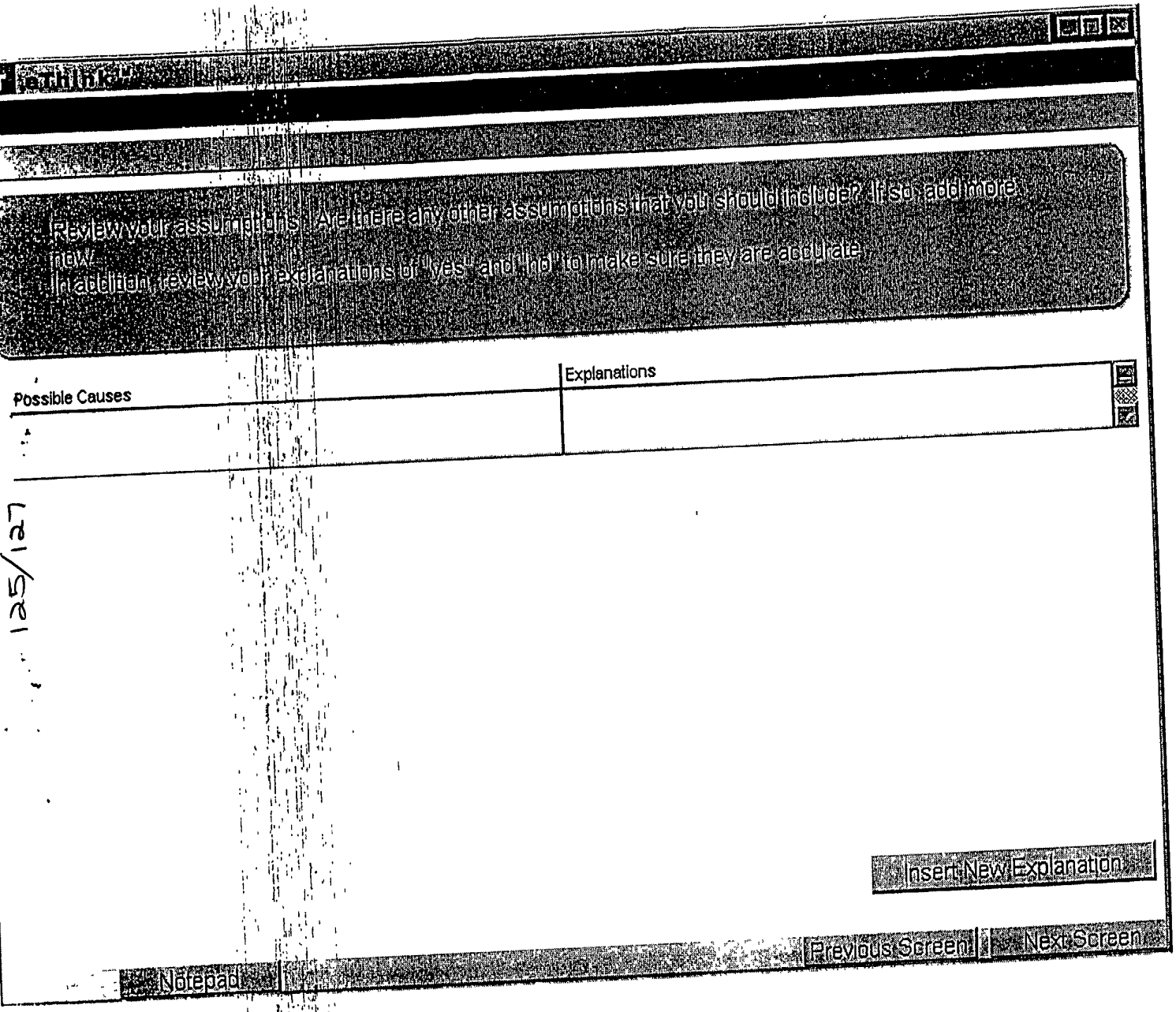

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Fig. 135

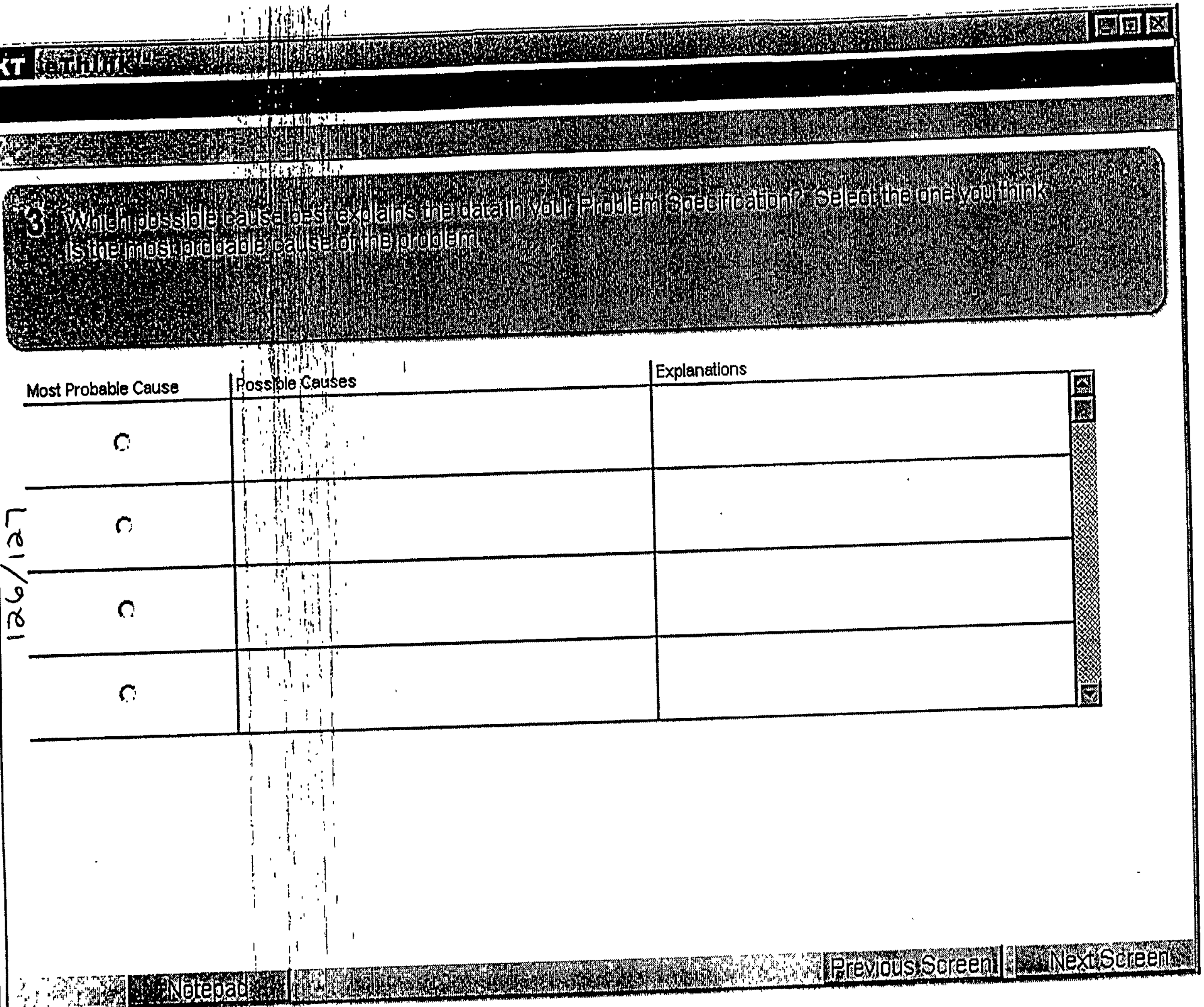

Fig. 136

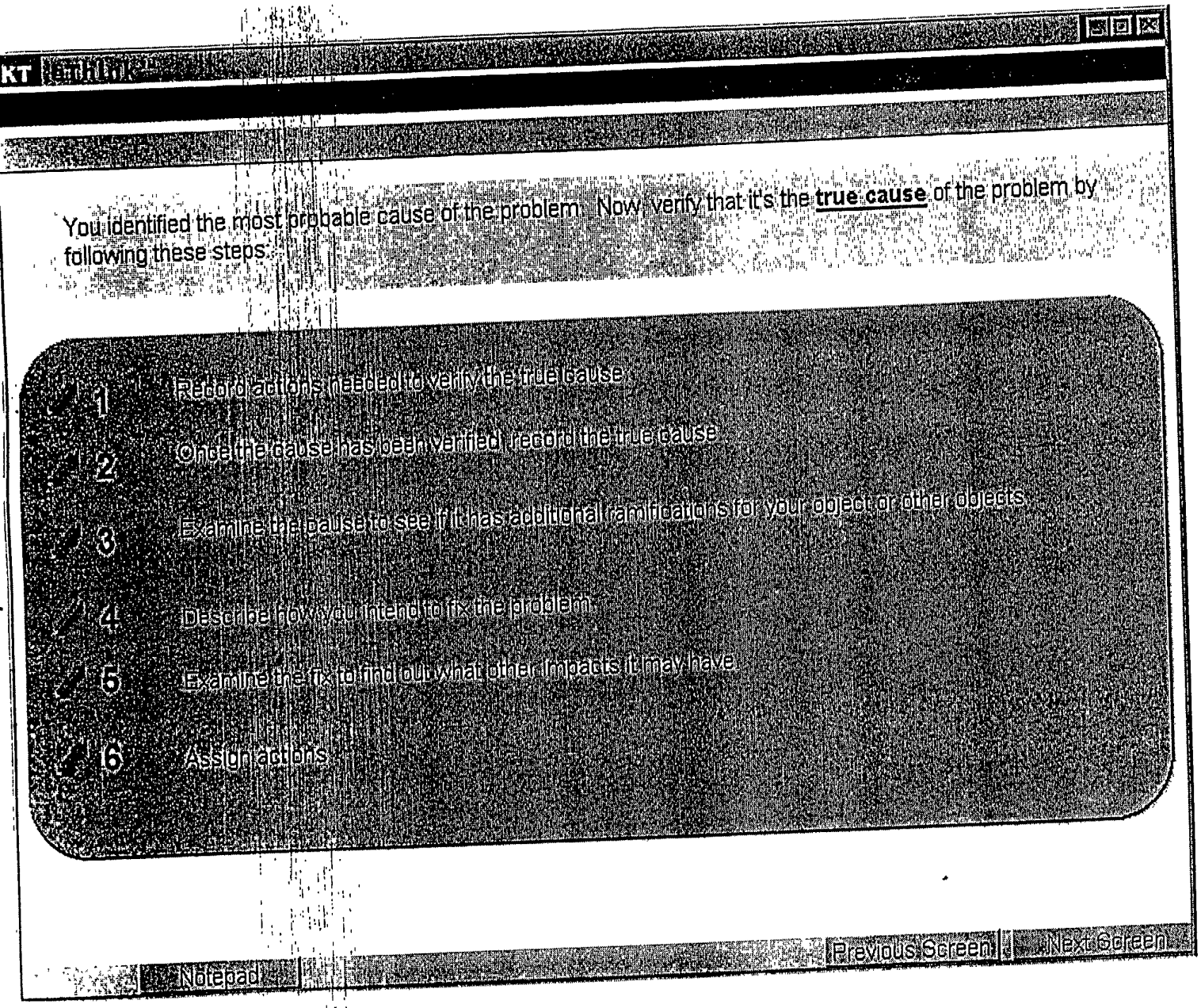
You identified the most probable cause of the problem. Now, verify that it's the true cause of the problem by following these steps:
1 Record actions needed to verify the true cause
2 Once the cause has been verified, record the true cause
3 Examine the cause to see if it has additional ramifications for your object or other objects
4 Describe how you intend to fix the problem
5 Examine the fix to find out what other impacts it may have
6 Assign actions
Notepad
Previous Screen
Next Screen

Fig. 137

DECLARATION AND POWER OF ATTORNEY

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: METHOD AND APPARATUS FOR PROBLEM SOLVING, DECISION MAKING AND STORING, ANALYZING, AND RETRIEVING ENTERPRISEWIDE KNOWLEDGE AND CONCLUSIVE DATA
the specification of which (check one):

[X] is attached hereto. [ ] was filed _____ as Application No. _____ amended on _____ (if applicable).

[ ] was filed as PCT International Application No. _____ on _____, and was amended under PCT Article 19 on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations §1.56(a).

I hereby claim foreign priority benefits under Title 35, USC §119(a)-(d) of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)		Date Filed	Priority Claimed	
(Number)	(Country)	(Day/Month/Year)	[ ] Yes	[ ] No
(Number)	(Country)	(Day/Month/Year)	[ ] Yes	[ ] No

I hereby claim the benefit under Title 35, USC §119(e) of any United States provisional application(s) listed below:

60/091,476 (Application Number)	July 2, 1998 (Filing Date)
60/133,746 (Application Number)	May 12, 1999 (Filing Date)
(Application Number)	(Filing Date)

Express Mail Number
EL418425196US

Attorney Docket No.: KT-001AX

I hereby claim the benefit under Title 35 USC §120 of any United States application(s) listed below and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35 USC §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

09/347,238	July 2, 1999	Pending
(Application No.)	(Filing Date)	(Patented/pending/abandoned)
(Application No.)	(Filing Date)	(Patented/pending/abandoned)
(Application No.)	(Filing Date)	(Patented/pending/abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) to prosecute this application and transact all business connected therewith in the Patent and Trademark Office, and to file with the USRO any International Application based thereon.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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	Sandra Lee	Sean Connelly	Christabel Nazareth
	Jad Santos	Justin Wilmsmeyer	James Mullins
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Full Name of Sixth Joint Inventor: Jad Santos		
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Attorney
Docket No.: KT-001AX

Full Name of Seventh Joint Inventor: Phong Dinh		
City of Residence Los Angeles	State or Country CA	Country of Citizenship USA
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Full Name of Eighth Joint Inventor: Rachel Cline		
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Post Office Address 470 West End Avenue #3G	City New York	State or Country Zip Code NY 10024
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Full Name of Ninth Joint Inventor: Rich Berner		
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Attorney
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Full Name of Tenth Joint Inventor: Gloria Gery		
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Post Office Address 108 South Trail	City Tolland	State or Country Zip Code MA 01034-9403
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Full Name of Eleventh Joint Inventor: Robert Yardumian		
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Full Name of Twelfth Joint Inventor: Katherine Nicole Bussard		
City of Residence North Hollywood	State or Country CA	Country of Citizenship USA
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Attorney
Docket No.: KT-001AX

Full Name of Thirteenth Joint Inventor: Sean Connelly		
City of Residence Hermosa Beach	State or Country CA	Country of Citizenship USA
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Full Name of Fourteenth Joint Inventor: Justin Wilmsmeyer		
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Full Name of Fifteenth Joint Inventor: Martin Vernon		
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Post Office Address 3701 Overland Avenue, #B223	City Los Angeles	State or Country Zip Code CA 90034
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Attorney
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Full Name of Sixteenth Joint Inventor: Karl Hogquist		
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Post Office Address 849 E. Victoria Street #612	City Carson	State or Country Zip Code CA 90746
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Full Name of Seventeenth Joint Inventor: Joel Schwarzbart		
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Post Office Address (c/o Romac) 15260 Ventura Boulevard, #380	City Sherman Oaks	State or Country Zip Code CA 91403
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Attorney
Docket No.: KT-001AX

Full Name of Eighteenth Joint Inventor: Peter DePaula		
City of Residence Los Angeles	State or Country CA	Country of Citizenship USA
Post Office Address 6660 Maryland Drive	City Los Angeles	State or Country Zip Code CA 90048
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Attorney
Docket No.: KT-001AX

Full Name of Nineteenth Joint Inventor: Barbara Stoeber		
City of Residence Belle Mead	State or Country NJ	Country of Citizenship USA
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Attorney
Docket No.: KT-001AX

Full Name of Twentieth Joint Inventor: Michael Smith		
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Attorney
Docket No.: KT-001AX

Full Name of Twenty-First Joint Inventor: Christabel Nazareth		
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Attorney
Docket No.: KT-001AX

Full Name of Twenty-Second Joint Inventor: James Mullins		
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Attorney
Docket No.: KT-001AX

Full Name of Twenty-Third Joint Inventor: Thomas H. Irwin		
City of Residence Belle Mead	State or Country NJ	Country of Citizenship USA
Post Office Address 13 Hiland Drive	City Belle Mead	State or Country Zip Code CA NJ 08502
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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application	:	James D. Schlick, et al.
Application No.	:	
Filed	:	HEREWITH
For	:	METHOD AND APPARATUS FOR PROBLEM SOLVING, DECISION MAKING, AND STORING, ANALYZING, AND RETRIEVING ENTERPRISEWIDE KNOWLEDGE AND CONCLUSIVE DATA
Examiner	:	
Attorney's Docket	:	KT-001AX

Group Art Unit:

* *

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box Missing Parts, Assistant Commissioner for Patents, Washington, D.C. 20231 on _____.

By:_____
Christopher J. Lutz
Registration No. 44,883
Attorney for Applicants

* *

REQUEST FOR DELETION OF INVENTOR UNDER MPEP § 201.03

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Pursuant to MPEP 201.03, it is requested that the below named individuals be deleted as inventors in the present application. These individuals were named as inventors on the unexecuted declaration filed in parent application No. 09/347,238, filed July 2, 1999, entitled METHOD AND APPARATUS FOR PROBLEM SOLVING,

WEINGARTEN, SCHURGIN,
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Express Mail Number
EL418425196US

DECISION MAKING, AND STORING, ANALYZING, AND RETRIEVING ENTERPRISEWIDE KNOWLEDGE AND CONCLUSIVE DATA, to which the present application claims priority.

Chris Serrano
Jen McLane
Ramon Rono
Lisa Mentz
Josh Geller
David Schapiro
Kevin Osborne
Kevin Nguyen
Catherine Lau

Respectfully submitted,

JAMES D. SCHLICK, ET AL.

By: [signature]
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Date: 1/28/00

CJL/jds/219412
Enclosure

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